

# COMPUTERWORLD

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**FCC price caps** soar above what AT&T wants to charge for T1 and T3 circuits. Page 47.

## Wang woes ruffle loyal users

BY PETER BARTOLIK  
CW STAFF

Customers of Wang Laboratories, Inc. are standing by their vendor — for now. However, in an exclusive *Computerworld* survey of Wang customers last week, 39% said they are not confident that the company can solve its current problems.

### Crisis in confidence

*Few of the 100 surveyed Wang customers have deserted the vendor, but many lack confidence*

Has Wang's financial news prompted any decision to purchase from other vendors products you would have obtained from Wang?

YES 22% NO 78%

Are you confident in Wang's ability to solve its current financial situation?

YES 61% NO 39%

CW CHART: DOREEN DAHLE

Wang's continuing financial woes, which resulted in a \$424.3 million loss in the fiscal year just ended and the resignation of company president Frederick Wang last week, have not completely alienated customers. Many of the 100 surveyed expressed confidence in its technology, if not its management.

Only 10% of those surveyed said they have reduced purchases from Wang in the past 12 months, compared with the previous 12 months.

However, while a large majority said their spending plans have not been affected, 22% said the company's financial crisis is

causing them to reevaluate their plans.

The lack of confidence indicates Wang may face tougher days if it cannot stem the flood of bad news. The following warning signs were evident:

- While 38% of those surveyed have increased spending on Wang products, that was less than the 45% who have increased systems spending in general. The 28% who have decreased spending on Wang products represent a significantly greater number than the 19% who have decreased overall systems spending.

*Continued on page 6*

## Shake-up designed to shock

BY PATRICIA KEEFE  
CW STAFF

LOWELL, Mass. — In the eyes of respectful colleagues, Frederick Wang did the noble thing last week. He resigned.

Wang Laboratories, Inc. is hoping to shock critics and customers into realizing that the family-controlled business is not only open to new ideas but is also serious about moving forward as

it seeks a new executive to take charge of the company (see story page 6).

"We needed a dramatic message, and Fred's noble and symbolic decision to step down as president certainly [was that], which is good, because it shows that we *are* serious," said Kenneth Olisa, Wang's vice-president of worldwide marketing, in an interview last week.

*Continued on page 6*

## Buyer's market for 386 PCs

BY PATRICIA KEEFE  
CW STAFF

Good things come to those who wait. In the case of an Intel Corp. 80386-based purchase, a few months of toe-tapping could produce savings averaging between \$400 and \$600 per box.

An overabundance of choices at the high end of the PC market, coupled with an absence of software optimized for a 32-bit data path, are driving down the cost of sub-25-MHz 80386 PCs. This comes in the midst of a vendor scramble to differentiate products and a dealer slugfest over slowing sales.

Storeboard, which tracks computer retail sales, said that price drops between the first and second quarters ranged from \$225 to \$957 on various 386

models in the 16-MHz 80386SX to 20-MHz category. Introductions from first-tier vendors and rampant discounting among second-tier suppliers were the primary incentives, said JoeAnne Stahel, Storeboard president.

*Continued on page 13*

## Science to take the high-speed route

BY ELISABETH HORWITT  
CW STAFF

Congress may finally provide the necessary funding for a high-speed supercomputer network that could revolutionize how research is performed in the U.S.

The proposed National Research and Education Network would "change the way science is done" by allowing research groups to collaborate over distance via direct, high-speed, computer-to-computer interaction, said Steve Wolff, director of networking for the National Science Foundation, a major participant in the project.

NREN represents "the single most important step we can take to lift the competitive ability of all American companies and individuals who are doing business in the information age," said U.S. Sen. Albert Gore Jr. (D-Tenn.) in an interview with *Computerworld*. Gore is the congressional champion of the network.

Researchers at the Pittsburgh Supercomputing Center daily bemoan the fact that they cannot hook up with other groups throughout the country, said Mi-

## Repository forces lined up by IBM

BY STANLEY GIBSON  
and ROBERT MORAN  
CW STAFF

Customers and independent software vendors said last week that IBM is set to roll with the announcement of its long-awaited repository Sept. 19.

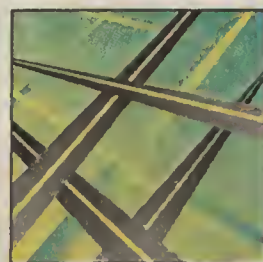
Several vendors of computer-aided software engineering products said IBM is also expected to announce a new version of its Cross System Product that generates Cobol code.

The repository, a sophisticated data dictionary for storing information about the development and deployment of software applications, is expected to speed application development by providing a point of reference for CASE tools.

Several attendees at the first International DB2 Users Group meeting in Chicago last week told *Computerworld* that they were informed by their IBM representatives that the announcement of the repository would be made Sept. 19.

IBM has said publicly that the repository will initially work with DB2 under MVS and will later work with the relational database management systems of other Systems Application Architecture platforms, including OS/2 Extended Edition Database Manager, SQL/DS under

*Continued on page 8*



TOM MONAHAN

chael Levine, the Center's co-scientific director. Any number of projects now under way at the center, such as pollution and atmospheric modeling, are cooperatively worked on by different groups and computers at different institutions, with one group regularly requiring input from another's work, Levine added.

However, the long-distance bandwidth is simply not available for real-time system-to-system collaboration in which, for exam-

*Continued on page 104*



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## Quotable

**"F**red was never calling the shots anyway. Dr. [An] Wang will have to cede control to get Wang on the right track."

JIM LEARY  
AMERICAN FINANCE GROUP  
On the resignation of Frederick Wang. See story page 1.

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# EXECUTIVE BRIEFING

■ **User loyalty appears to be surviving** despite the turmoil at Wang Laboratories, with its heavy losses, uncertain future, the resignation of company President Frederick Wang and the speculation about his successor. In a *Computerworld* survey, only 10% of information systems executives said they have reduced the number of purchases they make from Wang. But there is a noticeable amount of skepticism about Wang's fortunes, with almost 40% of the users saying they are not confident that the company can solve its current problems. **Page 1.**

■ **At long last, a repository?** Several years in the making, and already once reported to be the victim of a canceled introduction, IBM's sophisticated data dictionary is now slated for a Sept. 19 announcement. That repository is expected to be a vehicle for holding key information about applications and thus may speed application development by providing a standard point of reference for both IBM and third-party vendors' computer-aided software engineering tools. **Page 1.**

■ **Doing a good sales job** is half the battle for information systems managers as they work to get a long-term project off the ground. IS must sell senior executives on their ideas and, as in the case of factory-floor automation projects, get line workers to buy into their proposals. One key move is to understand how people perceive the new system. **Page 61.**

■ **A new initiative**, computer-aided acquisition and logistics support, is at the heart of the U.S. Defense Department's effort to exchange technical product information with its contractors. CALS is expected to provide significant cost savings over weapons systems' life cycles by applying existing and emerging technologies to improve product development and support. The technique will ultimately surface in the commercial sector, too, and many IS executives will have responsibility for it in their companies. **Page 67.**

■ **Decisions on whether to buy** Computer Associates products, including database management systems and related software, have been frozen in some cases, primarily because CA has been unable to outline its own DBMS strategy. CA officials said last week such freezes are part of the reason it is unlikely to meet projected financial quarterly performance marks and tied the sales stall to CA's pending absorption of former

DBMS competitor Cullinet Software. **Page 4.**

■ **On the product front**, CA last week introduced a console automation package for IBM DOS/VSE that was designed to let IS shops reduce the need for computer operators in networked VSE environments. **Page 13.**

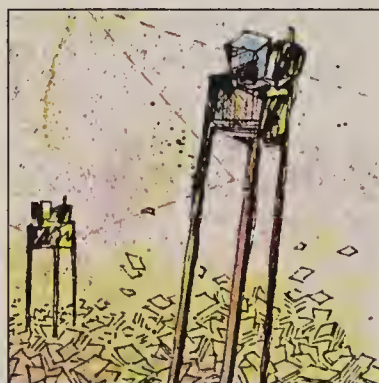
■ **You don't have to be a chief information officer** to put a computer to use when looking for a new job. Personal computer software can help at nearly every step, from clarifying your firm's long-term goals to identifying prospective employers and producing resumes. Experts emphasize the importance of an effective self-assessment as an important first step. **Page 85.**

■ **Before launching a training program**, determine whether it is the right answer to your problem, an expert on human performance urges. Alternatives that may be appropriate include recruiting, altering procedures, providing incentives, employing job aids or redefining roles and responsibilities. **Page 100.**

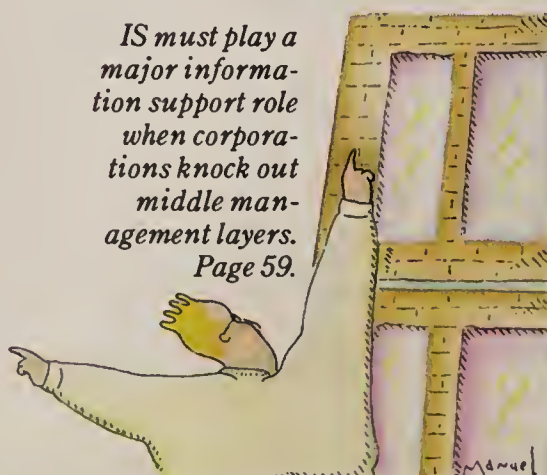
■ **Corning wants to formalize** peer-to-peer systems support by establishing a network of end users at various levels of technical sophistication. Those users could then be called on to help other systems users in their departments. **Page 60.**

**F**rost heaves. Alas, poor Route 128 — the main high-tech artery of Massachusetts — is taking such a beating in the press these days. Even the venerable *The New York Times* took out the quill whip last week and lashed the road that has been home to the East Coast's computer industry, bemoaning the decay of the minicomputer businesses there. We seem to recall a similar flogging of Highway 101 in California's Silicon Valley a few years ago when the chip industry hit the skids, only to be revived by the booming PC market. Amazing what a little repavement can do for a roadway.

*Islands of automation were destroying the DOD's ability to stanch its paper flow. Page 67.*



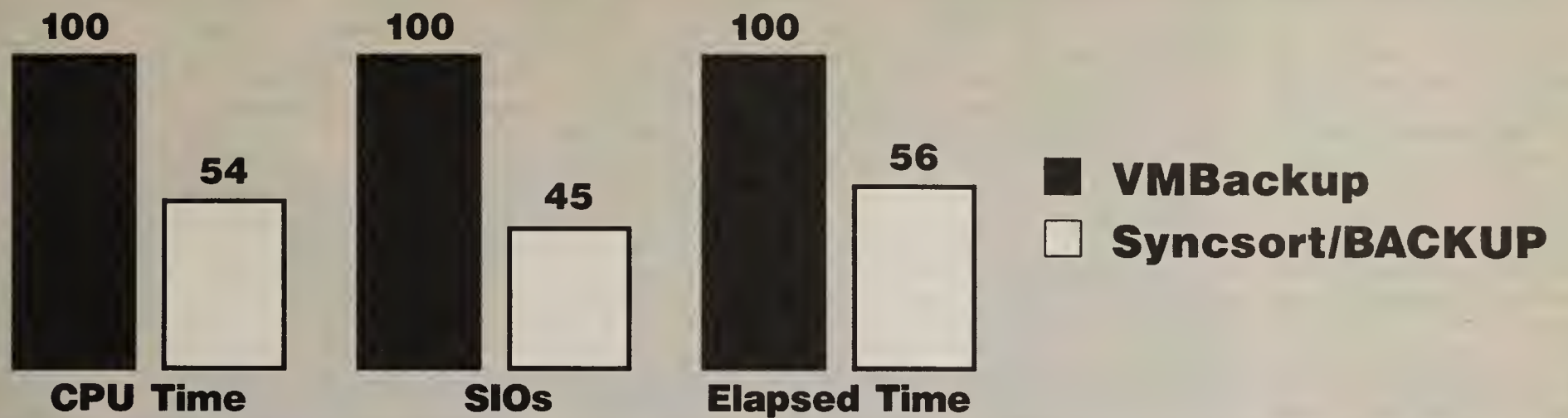
*IS must play a major information support role when corporations knock out middle management layers. Page 59.*



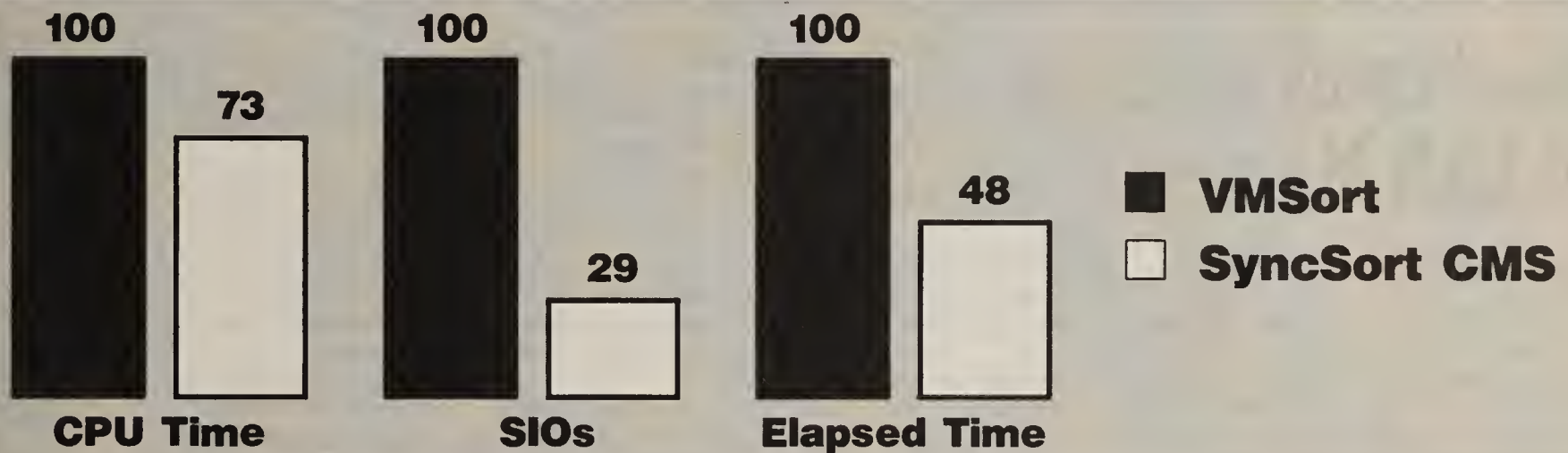


# VM PERFORMANCE FROM SYNCSORT

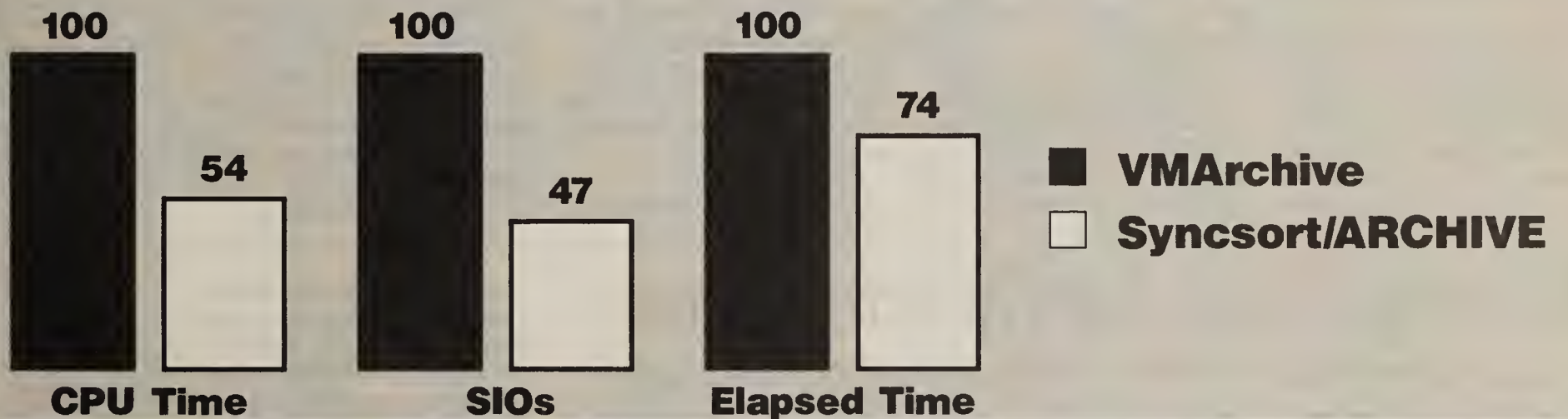
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# CA says financials off target

BY ROBERT MORAN  
CW STAFF

NEW YORK — Computer Associates International, Inc. waved a red flag last week, warning observers and shareholders that it will likely fail to meet its projected financial performance for the quarter ending next month.

The company pegged the blame on the likelihood that the merger of Cullinet Software, Inc., which had been slated for the middle of this month, will not be completed until the middle of September at the earliest.

CA President Anthony Wang conceded that the company does not normally issue such progress reports. However, prospective clients and current CA customers are waiting for the completion of the merger and for position papers regarding strategic direction on both Cullinet products, particularly IDMS/R, and

CA's products before they take the step of signing hefty contracts, Wang said.

In addition, he said sales have stalled on software associated with databases and on bundled software such as CA-Unipack and CA-Unicenter that were sold into large pending contracts "to try to increase the value of each sales opportunity."

If the deal had been closed by mid-August, CA would have had a month to distribute position papers and close sales.

On Friday, Cullinet said it had scheduled a shareholders meeting for Sept. 12 for the purpose of approving the merger. If the vote is favorable, the merger would be consummated shortly thereafter, the company said.

Charlotte Walker, vice-president of County Natwest USA, a consultancy in New York, said that CA was too ambitious with its original estimates for closing

the Cullinet merger and that the company wanted "to get all the bad news out before the day Cullinet shareholders vote on the merger."

## Unattended VSE

CA offers automated console system to eliminate operator attention. See page 13.

Separately, Cullinet announced last week that it expects a loss for the quarter ended July 31, with revenue falling "moderately below" the \$43.9 million posted a year earlier.

The company said it will not release further details if the merger goes through before the deadline for filing results.

Wang said his company has not written off the quarter and that it expects plenty of growth.

"There is still hope or expect-

tation, whether real or fantasy, about achieving our original goals for the quarter," he said.

Those goals are to achieve, through a combination of acquisition and internal growth, the ambitious marker of 30% quarterly revenue growth.

"Few companies have ever been able to achieve such growth over an extended period," said Robert Anderson, vice-president of Sutro & Co., a consultancy in San Francisco. "To assume [a slower rate] never could or would happen at CA would be bordering on a very myopic or unrealistic view."

On the Cullinet side, Wang conceded that 1,800 Cullinet employees have been placed under considerable duress while waiting for news about their fate.

Wang expressed sympathy but said, "We are not in a position to implement any of the actions that we will be taking or to discuss them until the deal is closed and we have control of Cullinet."

# Microsoft may pitch in to sell LAN Manager

BY PATRICIA KEEFE  
CW STAFF

BELLEVUE, Wash. — Conversations last week with 3Com Corp. and Microsoft Corp. officials pointed strongly toward the possibility of some type of direct-sales offering from Microsoft by mid-1990, should LAN Manager's dismal market sales fail to pick up.

Reports that Microsoft was on the verge of doing just that surfaced last week, following visits by Mike Murray — Microsoft's newly appointed director of networking business — to key resellers and end users as well as

recent admissions from 3Com that its LAN Manager-based network software has not met sales expectations.

In an interview, 3Com President William Krause confirmed that he has discussed the possibility of Microsoft directly selling a low-end, stripped-down version of the LAN Manager that would provide strictly print and file services to stand-alone work groups.

"Longer term, there might be a good reason to do this," Krause said, adding that Microsoft Vice-President Steve Balmer agreed that "now is not the time to do this, for availability of

resource reasons." Balmer could not be reached for comment.

With just a handful of OEMs shipping products, LAN Manager sales to date are barely perceptible.

## Way down

"They are abysmal," said a network consultant who sells both LAN Manager and chief rival Novell, Inc.'s Netware.

As a result, OEMs have a six-month window after many of their products hit the market in the fourth quarter to establish Microsoft's OS/2 file server as a viable alternative to other network software, Murray said, most notably Netware. Part of the problem is that Microsoft underestimated how long it would take OEMs to bring products to market, he added.

"It's correct that that is not happening today," he admitted.

"I wouldn't be here in this job if the company didn't have some concern over where the product is going."

Microsoft perceives the network business as a tremendous opportunity and would like to grow in that market in the next year, he said. "We are concerned that we not let time go by and that we take advantage of every moment," Murray said. "If we find that the OEM strategy is not providing a broad enough marketing strategy, we'll complement it with additional distribution strategies." He declined to provide specifics.

All this is not to say that Microsoft is holding a gun to OEMs' heads or expects to blow Netware away. "Netware has been in [large accounts] for years — it's not a level playing field," Murray said. "But that doesn't mean that we are locked out."

# Moller assumes top Gillette IS post

*Finance, international experience to help overseas integration goals*

BY DAVID A. LUDLUM  
CW STAFF

BOSTON — Gillette Co. has named Herbert W. Moller, a senior financial manager with recent experience in Europe, as vice-president of MIS, the company's top information systems post.

Moller, 48, who reports to Chief Financial Officer Thomas Skelly, assumes a position that was vacant for a year. Last month, he succeeded Kevin Moody, who left Gillette last summer to explore launching a reservation service, then canceled the project and opted to become Bank of Boston Corp.'s top

information systems executive.

Moller moves into IS having spent his entire career in financial positions with Gillette, most recently as chief financial officer for the Braun AG subsidiary, a manufacturer of electric shavers and small appliances based in Kronberg, West Germany.

In future years, Gillette plans to create information systems to support integration of European and American opera-

tions, and Moller's financial background and European experience will help in that effort, Skelly said.

Many of the applications to be integrated are financial, he said.

Moller, who is currently in West Germany, oversaw the IS organization at Braun. The subsidiary's 1988 sales of \$824 million accounted for 23% of Gillette's overall revenue of \$3.6 billion.

Moller graduated from the

University of Pennsylvania in 1964 with a bachelor's degree in liberal arts, earned an MBA from the university's Wharton School of Business in 1966 and joined Gillette that year as a financial management trainee.

He went on to work with Gillette's Safety Razor Division in Boston and Personal Care production facility in Andover, Mass., and then served as manager of distribution and accounting at the firm's Boston headquarters.

In 1974, Moller was named controller for Gillette Canada in Montreal and two years later became director of industrial accounting for Gillette North America in Boston.

In 1980, he joined Braun in West Germany, where he assumed the position of chief accountant.



Gillette's Moller

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1: IBM Journal of SAA 2: DATAPRO survey, August 1988, companies with sales over \$10 million 3: Donaldson, Lufkin & Jenrette report

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	Los Angeles	Aug 15m Sept 19cl
	Newport Beach	Aug 10a Sept 28f
	Pasadena	Sept 12f
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	San Diego	Sept 21af
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	Denver	Aug 22#* Sept 11u
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	Miami	Sept 20f
	Tampa	Sept 6cf
GA	Atlanta	Sept 13cl
	Savannah	Aug 10c
HI	Honolulu	Sept 14fp
IL	Chicago	Aug 23cf
	Springfield	Sept 14* Sept 20am
IN	Ft. Wayne	Sept 7
	Indianapolis	Aug 29f
KS	Wichita	Aug 15
KY	Lexington	Sept 19
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NE	Omaha	Aug 3* Sept 28
NH	Bedford	Sept 6
NJ	Asbury Park	Aug 8#u*
	Iselin	Aug 22f Sept 12m
	Saddlebrook	Sept 21f
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OR	Tigard	Aug 22fpa
PA	Harrisburg	Aug 22
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COMPUTERWORLD



## Shake-up

FROM PAGE 1

The company has launched an intensive worldwide search to locate a new president, preferably someone with both industry and turnaround experience.

"They need an ax-man, as opposed to a technical visionary," said David Wu, an analyst at W. S. Warburg in New York.

"They need to cut once and cut deep," said Mary Modahl, an analyst at Forrester Research, Inc. in Cambridge, Mass.

Industry observers are betting that piles of pink slips will be used to sandbag the flood of red ink that resulted in a \$424.3 million loss for the past fiscal year.

Until a successor is chosen, longtime Wang

executive Harry H. S. Chou, 66, will serve as acting president and chief financial officer.

In the meantime, Fred Wang is expected to remain on the board of directors and reportedly will handle special projects to be determined at a later date. His father, founder An Wang, now back at work part-time while recovering from cancer surgery, is expected to return full-time in September. Neither was available for interviews.

Wang's openness is a point that needed to be emphasized, even at the cost of skewering An Wang's heir apparent. "Fred is partly a scapegoat and partly to blame for Wang's recent terrible

results," Modahl said.

Shao Wang, an analyst at Smith Barney, Harris Upham & Co. in New York, laid some of the blame on An Wang's shoulders.

"Fred really got hold of the company reins during a difficult time in the industry. And his father was there the whole time, at the very least looking over his shoulder," Wang said. Then there is the question of who rejected a reputed offer for Wang's Intecom subsidiary, Wu said. "Someone had to take the rap, and since Dr. Wang wasn't going to, the son had better. It's a sad story," he added.

Wang is not only mired in a company-threatening financial crisis, but its longtime inertia has also led to accusations of "bird-cage management," which suggested that the company's response to business crises is to flutter about the executive offices, the same players eventually landing on different perches.

That image "caused a great deal of hurt within Wang Laboratories, because we have been working on a restructuring for the last 12 to 15 months," Olisa said. "Now, finally, this refocusing is coming to the attention of the industry."

Customers loyal to Wang's technology are sticking by their supplier (see story page 1).

"Of course, they were all shocked and amazed at first," Olisa said, adding that Wang is moving quickly to assuage any concerns. The minimaker plans

ply] that its problems were based on Fred's ability, but Fred may not have had as much say as he should," said Douglas Braun, director of data processing at Chem Bio Corp. in Oak Creek, Wis. "I don't wholly blame Fred; An still had a hand in things."

"Fred was never calling the shots anyway," agreed Jim Leary, operations manager at American Finance Group, Inc. in Boston. "Dr. Wang will have to cede control to get Wang on the right track."

That view was not unanimous, however. Avowed Wang supporter William Perod, director of data processing at Mueller Brass Co. in Port Huron, Mich., said, "I think it's a great shot in the arm to get Fred out of there." Perod, with \$4 million in Wang equipment in the company, gave high marks to Wang service and products.

Whether they supported Frederick Wang or not, those contacted after the announcement agreed that creating the perception that it is acting to resolve its problems was a positive step for the company.

It seems Wang wants to [im-



Fred Wang

## Eyes drawn to Cunningham

BY NELL MARGOLIS  
CW STAFF

In the wake of Frederick Wang's sudden and unexpected departure from the job for which many say he was destined but not qualified, speculation on a successor focused on the executive whose rise in the company was once considered eclipsed by that of the founder's son.

Those who know him generally agree that former Wang president, current computer industry consultant and proven turnaround man John F. Cunningham has the credentials to right the badly listing company.

With Wang in debt, low morale and eroded customer confidence, a would-be president needs four essentials, according to Mike Geran, who follows Wang for Nikko Securities International, Inc.

"He's got to be well-positioned to get the confidence of bankers; he has to be able to get his hands around the company's finances — either do it or delegate it; he has to improve the [corporate and commercial] focus; and, of course, he has to appeal to customers," Geran

said. In addition, said a computer company executive who wished to remain anonymous, the new Wang head should be ready and able to make draconian cuts in management.

By these standards, Cunningham is straight from central casting. In 1985, faced with being an outside executive in a family company, he stepped out of the Wang presidency and into Computer Consoles, Inc. (CCI), a then-founding \$12 million company. Over the next two years, a management team recruited by Cunningham implemented a program of cost cuts, corporate reorganization and product-line focus that catapulted the company back into the black and culminated in the late 1988 sale of CCI to British electronics giant STC PLC for \$168.4 million.

All of which makes Cunningham a good bet — but certainly not a sure thing. The Wang search committee maintains that their minds are open. Cunningham could not be reached for comment last week. That could be telling, noted longtime friend and colleague John Cullinane. "The fact that he's lying low could mean that he's in negotiations," he said.



Cunningham

of the tangible net worth requirements in its revolving credit agreements. On Thursday, the banks granted a second waiver of compliance until Wednesday. Meanwhile, Wang is also working with the banks to roll over its current debt, which expires Sept. 30, Wang Director of Investor Relations Paul Henning said. "If you read between the lines, it's just a matter of days" before the agreement is settled, he said.

Even so, the losses and Fred

Wang's departure have stirred speculation that the way is now clear for any takers to buy Wang. Not so, said Olisa, who noted that senior managers in European firms often resign after posting negative financials as a form of ritual atonement. It's just as well, said some analysts, who questioned why Wang would want to sell when its stock is at an all-time low and why anyone would want to buy when its products are in what analysts call old, soft or emerging markets.

## Wang woes

FROM PAGE 1

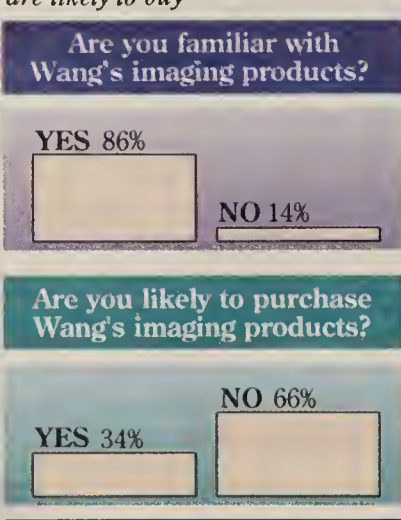
• The company's imaging products, a key strategic element in long-term plans, were familiar to 86% of respondents. But only 34% indicated they are likely to buy those products.

• IBM appears to be the safe bet for an alternate vendor. With 22% indicating they have decided to purchase from other vendors some of the products they normally would have acquired from Wang, 17 companies indicated they would likely turn to IBM; six said Digital Equipment Corp. would also benefit, and several said they would buy from more than one vendor.

The survey was conducted last Monday and Tuesday for *Computerworld* by High Technology Marketing in Southbury, Conn. Although those surveyed had not yet heard of Frederick Wang's resignation, follow-up interviews indicated that the shakeup was viewed as a positive move to improve the company's image but is unlikely to dramati-

### Dim image

Although most are familiar with Wang's imaging products, only a third of those surveyed say they are likely to buy



CW CHART: DOREEN DAHLE

cally influence the manner in which the company is run.

In fact, several of those contacted in the wake of the resignation expressed the belief that Wang was being made a scapegoat. In a departure from tradition, they blamed founder and chairman Dr. An Wang.

"It seems Wang wants to [im-

ply] that its problems were based on Fred's ability, but Fred may not have had as much say as he should," said Douglas Braun, director of data processing at Chem Bio Corp. in Oak Creek, Wis. "I don't wholly blame Fred; An still had a hand in things."

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Whether they supported Frederick Wang or not, those contacted after the announcement agreed that creating the perception that it is acting to resolve its problems was a positive step for the company.

"Some customers will turn away from Wang because of its financial problems," said David Cummings, director of data processing at Marketing Corporation of America in Westport, Conn. "To reverse that perception, Wang has to do something drastic. I think removing Fred is just such a drastic step."

There was also a general sentiment among those surveyed that their investment in Wang's technology would survive whatever financial solution the company and its bankers agree on.

"At no time during these financial problems have we lost our faith in the ability of Wang's technology to survive this problem," Cummings said.

Steven Sullivan, data processing manager at T. Rowe Price and Associates in Baltimore, predicted that the technology will outlive the company. "I think they're going to get bought, but Wang will be fine one way or the other," he said.

Senior Writers Amy Cortese and Alan J. Ryan researched this report.

### Still on board

Spending on Wang products in the past 12 months has been relatively even, and a majority of surveyed customers say recent financial news will have no impact on spending

Spending on Wang products in the last 12 months compared with the previous 12 months		Impact of recent business results on intentions to purchase Wang products	
• Increased	38%	• Plan to increase	0%
• Decreased	28%	• Plan to decrease	10%
• Stayed the same	34%	• No impact	68%
		• Reevaluating plans	22%

CW CHART: FRANK C. O'CONNELL



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## NEWS SHORTS

### MAI bid expires

"No LeBow" went from T-shirt slogan to matter of near fact at Prime Computer, Inc. last week with the expiration of MAI Basic Four, Inc. and Chairman Bennett LeBow's offer to buy Prime's minicomputer business. MAI declined to extend the offer in the face of Prime's repeated postponements of its annual meeting and repeated endorsement of an offer from venture capital firm J. H. Whitney, Inc., making last Thursday the first date since November 1988 on which there was no offer from MAI on the table at Prime.

### Freeze at Unisys

Last week, it was Unisys Corp.'s turn to announce a hiring and salary freeze, following a disappointing quarterly report. A spokesman dismissed the move as another element of an earlier announced cost-containment initiative. However, Unisys confirmed that its 67% second-quarter profit drop tracks diminished demand for computers, which is not the kind of problem that a wage freeze can turn around, skeptical analysts said.

### Stratus picks Pick

Stratus Computer, Inc. said last week that Pick Systems' Pick operating system and Pick-based office automation software is now generally available for its systems. Stratus said it integrated Pick with VOS, its proprietary operating system.

### HP signs up IBM

IBM announced last week that it will use Hewlett-Packard Co.'s Network License System (NLS) in its computer-aided design, manufacturing and engineering products. Through NLS, which is produced by HP's Apollo division, end users can license software based on the maximum number of simultaneous users. A copy of the software is installed on a computer, and a license is issued when a user accesses it. When the application is returned, the license is made available to other users.

### Next hits the streets

Curiosity seekers converged on Businessland, Inc. stores in the San Francisco area last week as the first Next, Inc. computer systems went on sale to the general public. Although the initial response was tempered by a lack of wide-ranging software and delays in finishing Version 1.0's operating system, customers seemed impressed with the trim black machine. Widespread availability is expected late next month.

### Anti-price-caps group founded

Several user groups last week formed a coalition, Telecommunications Users for Regulatory Fairness, to oppose a federal plan to apply price-caps regulations to local telephone companies. The coalition argued that the Federal Communications Commission's proposal would cost users \$4 billion over four years. Meanwhile, AT&T complained to the FCC that MCI Communications Corp. failed to file new tariffs when offering discounts to large customers such as Merrill Lynch & Co.

### Sikes sworn in at FCC

In other FCC news last week, Alfred C. Sikes was sworn in as chairman of the commission after winning confirmation by the U.S. Senate. Sikes was the chief of the National Telecommunications and Information Administration in the Reagan administration. Two other FCC nominees, Sherrie P. Marshall and Andrew C. Barrett, won confirmation and will be sworn in later.

### COS cuts workers

The Corporation for Open Systems (COS) International, the McLean, Va.-based consortium promoting systems interoperability, laid off 41 of its 100 employees last week because sales of its testing software failed to meet revenue expectations. COS officials added that the downsizing was needed to avoid duplicating the efforts of several allied open systems groups.

## Waiting for IBM's C compiler

BY JEAN S. BOZMAN  
CW STAFF

SAN FRANCISCO — Software vendors around the country are tapping their feet, waiting for IBM to deliver a C compiler for the Application System/400 midrange system. But IBM, which set no date for the C compiler's release, says that the C compiler — promised for all Systems Application Architecture (SAA) platforms — will not be announced until it is ready, probably by year's end.

"The question becomes, when did the clock start ticking?" an IBM spokesman said last week, adding that internal guidelines call for intentions to be fulfilled within two years. "In March 1987, we said we'd support C on all SAA platforms, but the AS/400 wasn't announced until June 21, 1988."

In January, IBM shipped a C compiler for the 370/MVS mainframe environment after discontinuing a third-party C compiler it had been selling for 370 systems. IBM sells a C/2 compiler for the Personal System/2's OS/2 operating system.

Meanwhile, software vendors such as Cincom Systems, Inc. in Cincinnati, Management Sci-

ence America, Inc. in Atlanta, McCormack & Dodge Corp. in Natick, Mass., and Pansophic Systems, Inc. in Lisle, Ill., await the C compiler code, which is being developed at IBM's Toronto software laboratory.

"We're waiting, like everyone else," said Tom McLean, vice-president of marketing and product planning at Cincom. The firm's Mantis application development tool and Supra relational database are both written in C and could be ported to the AS/400 within weeks, once IBM's C compiler is shipped. McLean

says he is shopping for another AS/400 C compiler — if one is available. "If we find another C compiler, we could make the AS/400 SAA-compliant before IBM does," he said.

IBM is working on linking C with older, internal IBM programming languages such as PL/1 and PL/S, said James Hamilton, a C developer at IBM's Toronto facility. IBM is developing a common programming interface for all SAA languages, including C, he said. "We've already announced C/370 for the mainframe," he said at a recent IBM briefing, "and the next version of C is for the AS/400."

Some vendors, such as M&D,

have taken a wait-and-see attitude, believing that IBM's C compiler may not emerge until 1990. "That C compiler for the AS/400 was not promised to us by IBM. It was positioned as a future objective," an M&D spokesman said.

But IBM says users and vendors alike can start developing C code for the AS/400 right now by following published SAA guidelines. "They can write the C code using the C 370 compiler," said Millie Clarke, manager of language products for IBM. "You can write the application if you have the SAA language definition, but you can't execute it until the compiler becomes available on that platform."

There may be some competition on the horizon, however. One small Southern California firm is racing to ship a C compiler for the AS/400 before IBM does. Amalgamated Software of North America, Inc., in Newport Beach, Calif., is moving its C compiler into beta-test sites next month. Shipment of the product is expected by year's end.

Anne Ferguson, president of Amalgamated, which sells RPG compilers for the System/36, believes that IBM will announce its C compiler this fall but that IBM may not ship it until the second quarter of 1990.

## IBM

FROM PAGE 1

VM and the OS/400 database.

Along with IBM's repository announcement on the 19th, Pansophic Systems, Inc. will hold its Telon International User Conference in Scottsdale, Ariz., where it plans to announce Repository Manager, which will run on OS/2 and interface with the IBM repository, according to Anthony Paoni, vice-president of marketing at Pansophic.

An IBM spokesman would only say, "We have said we will introduce the repository this year, and we remain on plan to do that." IBM had reportedly scheduled the repository announcement on June 6, but postponed the announcement from that date [CW, June 12].

Both the repository and CSP, the fourth-generation language (4GL) that IBM is grooming as its SAA Application Generator, are part of IBM's SAA Application Development Environment.

The ability to generate Cobol code with its CSP product may be a key step in gaining support for its application development environment. At last week's IDUG conference, Carma McClure of Extended Intelligence, Inc. said that Cobol code represents a \$3 billion worldwide investment in information sys-

tems. "You can put all the 4GLs together, and they still fall behind Cobol," she said. IBM is known to have been working on a rewrite of its CSP with Transform Logic Corp. in Scottsdale.

Many CASE vendors are looking to the repository as a key to the success of the CASE industry in general; IBM has said a variety of independent software vendors' CASE tools will be able to work with the repository.

### Get up, stand up

"The current plans are to stand up and be counted as a vendor that 'enables' to the application development platform," said one CASE vendor that asked to remain anonymous.

While that CASE vendor will stand up in support of the repository, it will not express similar support of CSP. The vendor sells a generator that competes directly with CSP.

However, Mike Lyons, president of Asyst Technologies in Naperville, Ill., had a different view. "I'm an avid supporter of CSP because IBM wants me to be," he said.

Asyst makes CASE tools but sells no generator of its own. It has bridges to several other vendors that offer such products and plans to add a bridge to CSP, Lyons said.

The CASE vendor that requested anonymity also said

sources at IBM have indicated to him that the repository will include a data model that uses Knowledgeware, Inc.'s Information Engineering Workbench as the data analysis and design tool.

The vendor, a Knowledgeware competitor, said his firm plans to assert that its products will work equally well with the repository.

"We are going to release a position statement that will clearly differentiate ourselves," he said. The repository data model will also include CSP, he said.

Other vendors will offer tools to interface with CSP's External Source Format (ESF). A number of CASE vendors have announced support for ESF, which allows CSP to accept information from CASE tools.

A CASE analyst, who asked to remain anonymous, asserted, "Knowledgeware is the big winner because IBM has bought into their descriptive notion of the development process."

One software vendor said he understands IBM is picking a primary vendor in each area of interface with the repository.

The CASE analyst concurred, saying that the three preferred vendors will be Knowledgeware for business information systems planning, Index Technology Corp. for a front-end design tool and Bachman Information Systems, Inc. for database design.



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# IBM tweaks Rolm; no Siemens

BY ELISABETH HORWITT  
CW STAFF

IBM went ahead and announced several major enhancements to the Rolm 9751 private branch exchange last week, although it could not display its expected

signed and sealed partnership agreement with Siemens Information Systems, Inc.

IBM presented the enhancements, which included a long-sought Integrated Services Digital Network (ISDN) interface, at briefings intended to reassure

customers "who have expressed concern" about the two vendors' long-term commitment to the 9751 system, said Jim Long, senior vice-president of marketing at IBM's Rolm Systems.

Last December, IBM and Siemens announced their plans to

establish a joint working relationship, in which Siemens would take over Rolm's manufacturing and development arms and the two firms would establish a joint marketing and services firm.

The finalization of the agreement — expected last week — was delayed by last-minute legal details but "is very, very close" to fruition, a Siemens spokeswoman said. IBM and Siemens

are also expected to announce several new Rolm products from IBM Business Partners.

The product announcements address "a lot of things we've been looking for from Rolm in the past year or two," said Michael Seitz, regional telecommunications manager at Eastman Kodak Co. and publicity manager at the National Rolm Users Group. They included the following:

- The 9751 Model 10, which provides users with cost-effective support down to the 50-line range for the first time, said Rolm systems integration director Ron Raffensperger. "Before, [the 9751] was not cost-effective below 200 lines," Raffensperger said. Priced at \$101,000 for a 150-line system, the new model is said to provide savings of between 20% and 25% over the existing Model 20 for configurations that support between 100 and 150 lines. Shipping is scheduled for the first quarter of 1990.
- A T1 interface that, according to Seitz, "saves us a lot of switch real estate and provides easier maintenance" by requiring only one card instead of 12.
- Enhancements to call management software that allow users to obtain call-by-call details on data transmissions, as well as added troubleshooting capabilities for data circuits.
- Release 9005 of the internal 9751 software, which is said to enhance the capabilities of IBM's Callpath and Telephony Application Services, which were announced earlier this year, in areas such as automatic number identification.
- The Rolm 9722 Redwood Model III, a low-end system said to support from two to 48 lines.

## Some hope

Wearing his Rolm Users Group representative cap, Seitz was cautiously hopeful that the enhancements indicate a firm IBM-Siemens commitment to the 9751 over the next few years.

However, the announcement escalated rather than calmed the fears of some Rolm CBX 7000, 8000 and 9000 users, who have yet to hear from IBM whether it plans to continue its upgrades to those systems, said Cathy Cienkus, a spokeswoman for the Rolm Users Group and manager of telecommunications services at the Chicago Board of Options.

"The 9751 is the line where new development and engineering are taking place," Long said, adding, however, that IBM will implement 9751 enhancements on the other systems "wherever possible."

For example, the Rolm 9757 Adapter, which is said to allow users to communicate over ISDN networks via a Primary Rate Interface connection, supports all three systems, IBM said. It is scheduled for shipment during the first half of 1990, with pricing unavailable as yet.

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# HP taps Samsung for RISC-based PCs

BY J. A. SAVAGE  
CW STAFF

PALO ALTO, Calif. — In a bid to bring low-cost reduced instruction set computing (RISC) systems to market quickly, Hewlett-Packard Co. announced last week that it will license its technology to Samsung Electronics Co. and resell machines built by the Korean firm.

The Samsung computers will cost between \$5,000 and \$10,000, according to Peter Rosenblatt, research and development manager of HP's technical systems division. The company claims it will be

able to provide several times the performance of current workstations that run at 17 million to 20 million instructions per second.

HP decided to engage Samsung rather than produce its own machines because such a development scheme can bring a product to market more quickly than doing it alone, according to HP officials.

HP will sell Samsung's computers only at the low end and will not make any of its own. Samsung, based in Korea, will co-develop a chip set based on HP's Precision Architecture that will use fewer chips. The firm will manufacture its own

computers and will be able to sell those chip sets to third parties.

The move portends bringing RISC architecture to the personal computer arena. HP follows Sun Microsystems, Inc.'s June announcement saying that Sun would license its RISC Scalable Processor Architecture (Sparc) to two Taiwanese firms to build low-end, low-cost computers. Sun announced last week that N. V. Philips in the Netherlands had licensed Sparc for the European market (see story below).

"It's going to be a free-for-all between entry-level RISC systems," said Andrew

Allison, editor of the Los Altos, Calif.-based "RISC Management Newsletter." "It's going to be bloody."

Analyst Robert Herwick at San Francisco-based Hambrecht & Quist said that there is pressure on all vendors to pursue a RISC strategy. "It's a simple fact of life that RISC is more powerful than CISC [complex instruction set computing]," Herwick said. "As you add more software and applications with more artificial intelligence in the user interface, the computers become absolute pigs when it comes to using power."

The Samsung move is one more instance of the formerly stodgy, conservative HP turning around its marketing to that of an aggressive, if not glitzy, organization.

## Sun contracts with Philips to make RISC chips

BY JAMES DALY  
CW STAFF

SANTA CLARA, Calif. — Sun Microsystems, Inc. President Scott McNealy must have friends in high places.

Deep into last week's announcement that N.V. Philips will make microprocessors based on Sun's reduced instruction set computing (RISC) chip, an aftershock from an earthquake that had shaken Silicon Valley the night before rattled through the room, adding a theatrical touch to McNealy's earlier assessment that the news was "earthshaking."

While McNealy might have been overstating the case, the move is an important one for Sun. The arrangement with Philips Components, a division of the \$28 billion Dutch multinational company, puts Europe's biggest chip maker into Sun's corner at a time when the workstation maker is trying to establish its Scalable Processor Architecture (Sparc) instruction set as the standard in the RISC market.

"This is an important development to win the hearts, minds and porting slots of software developers," McNealy said. The arrangement also broadens the geographic vendor base of Sparc developers; Sun now has six suppliers of its chips in the U.S., Japan and Europe.

Such an expansion could be important for Sun, which is struggling with Mips Computer Systems, Inc., Motorola, Inc. and, more recently, Hewlett-Packard Co. to try to establish its chip as the dominant RISC architecture.

Under the agreement, Philips will produce 32-bit Sparc chips and build them into embedded controllers, which are intelligent circuits often used in everyday household machines such as telephones and televisions. Philips officials said they expect to bring these chips to market within two years.

While the move could broaden the implementation range of the Sparc chip, some analysts warned that it still does not address the nagging problem of providing software for Sun's Sparcstation. "You don't write software for embedded controllers; you write microcode," said David Card, an analyst at International Data Corp. in Framingham, Mass.

## SIMPLE SOPHISTICATION FOR THE PC WORLD.



### The V-series Smartmodem 9600 with V.42 or X.25 Standard.\*

The Hayes V-series™ Smartmodem 9600™ brought a technical sophistication to the high-speed dial-up world that had rarely been seen before.

The V.42 protocol, for point-to-point communications, automatically detects errors and then retransmits the data correctly. While the X.25 protocol not only offers error-control but also multisession access to value added networks with expanding applications for dial-up X.25 point-to-multipoint communications.

With adaptive data compression, the modem has the capability to double throughput to up to 19,200 bps.

And with Hayes AutoSync, it provides both synchronous and asynchronous communications without the extra expense of a synchronous adapter card.

The Hayes V-series Smartmodem 9600 has a sophistication that not only sets it apart from other PC modems, but above them as well.

\*There will be a minimal charge of \$50 for either a V.42 or X.25 upgrade on products purchased before October 1, 1988. Products purchased on or after October 1, 1988 will include either standard as they become available. For details call Hayes Customer Service: 404-441-1617.



# CA automates console system to relieve VSE operator duties

BY ROBERT MORAN  
CW STAFF

GARDEN CITY, N.Y. — Computer Associates International, Inc. introduced an automated console system last week for stand-alone and networked processors running the IBM DOS/VSE operating system.

The company said that the software product, called CA-Opera VSE, will automate the time-consuming message-and-

response cycle between the console and the operator by suppressing unnecessary and redundant messages and offering organizations the ability to program responses to common VSE messages.

Other console software products on the market reduce some of the interaction between the operator and the console, said Steve McManus, CA's director of marketing for VM and VSE products, "but CA-Opera VSE is designed to reduce message traffic and remove the operator

from the console."

Although CA-Opera software is usable with stand-alone VSE systems, McManus said it is designed for VSE systems networked from a single control console.

The software program, which resides on the mainframe and is based on VSAM structures, can communicate with other VSE systems on different processors by using a channel-to-channel connection. It can also communicate with VSE guests under the VM operating system by using a virtual channel-to-channel connection.

CA-Opera will support VSE/SP Version 2.1 and higher, running alone or as a guest under VM or VM/XA. Under graduated pricing, a CA-Opera VSE license for a Group 40 processor costs \$6,000, \$15,000 for a Group 50 processor.

## 386 PCs

CONTINUED FROM PAGE 1

"It's been a case of one-upmanship in that environment," said Robert Simko, executive director at International Technology Group in Los Altos, Calif.

"Salesmen are cutting whatever deals they can," agreed Jim Hammonds, manager of technical advisory services at The Sierra Group, Inc.

There are simply too many vendors hawking too many versions of the 386 PC. Users today can choose from a multitude of speed options on 386 boxes, including 16-, 20-, 25- and 33-MHz models. Users can also opt for either the 32-bit IBM Micro Channel Architecture bus or wait for the November arrival of the first 32-bit Extended Industry Standard Architecture computers.

Most of the discounting is targeted at the 16- and 20-MHz boxes, according to users and analysts, who claimed there is little difference in performance between those models, even when compared with a 20-MHz 286 running today's software. "Every vendor in the world with a bottom 16-MHz 386 is calling us and saying, 'We'll wheel and deal. We'll beat any offer,'" said Kingsley Mar, vice-president in charge of research development at Wells Fargo Bank in San Francisco.

Further fueling the price-sensitivity index is a large-scale move to the cheaper 386SX-based PC — believed by many to be the linchpin of an Intel campaign to kill the 286 platform. "The 386SX chip is the key to bringing the 386 to the desktop, because you can get the features of the high end without the extra cost," Mar said. There is only a \$75 difference in price between a 286 processor and the 386SX, he said: "The 286 is dead."

The logjam at the high end of the desktop is about to pile on top of an economic slowdown. At a July 25 analyst meeting, Microsoft Corp. projected 10% unit growth during the next 12 months in its Intel processor-related growth.

Abetting the slowdown is a longer sales cycle, Hammonds said. "The 386 is a more strategic product, requiring a minimum \$2,000 to \$3,000 per user investment vs. an under-\$1,000 minimum on an IBM XT-type machine, or \$1,300 for a 286," he added.

### Catch the price-cutting wave

Prudential Bache Securities, Inc. is predicting a wave of price-cutting this summer and fall as a response to sluggish sales of 286- and 386-based PCs, said analyst Kimball Brown in an Aug. 2 bulletin.

Brown noted that AST Research, Inc. has already instituted some price cuts and predicted that Wyse Technologies, among others, will shortly follow suit. "We've noticed some large differences in pricing between clones or what used to be the off brands, like Dell Computer and Wyse," added Tom Cornell, a senior consultant at Peat Marwick Main & Co.'s airport consulting group in San Francisco.

Cornell has noticed a 10% to 15% drop in prices on name-brand 20-MHz 386s in the last eight months. Each new, faster 386 tends to kick the next fastest model down in price by about 10%, he said.

What is needed to drive a new PC upgrade cycle, analysts said, is software compelling enough to entice users to buy. OS/2 applications capable of exploiting the 386's 32-bit data path are not expected until later this year or early 1990.

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# Following the leader at Macworld

BY RICHARD PASTORE  
CW STAFF

BOSTON — Last week's Macworld Expo was tangible proof that third-party developers are willing to follow Apple Computer, Inc. into the scantily charted territory of DOS connectivity. In June, Apple unveiled a host of connectivity products to help corral more traditional corporate interest, and now other firms are joining in the roundup.

Novell, Inc. subsidiary Excelan, Inc. typified the connectivity boosters' announcements at Macworld. The company unveiled its Fastpath LTR Gateway, which connects Apple LocalTalk to Token-Ring networks. It is also compatible with Apple's upcoming Tokentalk products, the San Jose, Calif., company said.

Other firms such as Palo Alto, Calif.-based CC:Mail, Inc. and Trumbull, Conn.-based Dataviz, Inc. announced that they are

broadening their connectivity products. CC:Mail is adding the Digital Equipment Corp. VAX/VMS platform to its Mac, OS/2 and DOS lineup, while Dataviz is incorporating Next, Inc. and Sun



CA-Cricket provides Bezier curves and smooth polygons

Microsystems, Inc. platforms into its bridging topology.

Not all companies are ready to stick their necks out for Mac connectivity, however. Richard Kreysar, vice-president of mar-

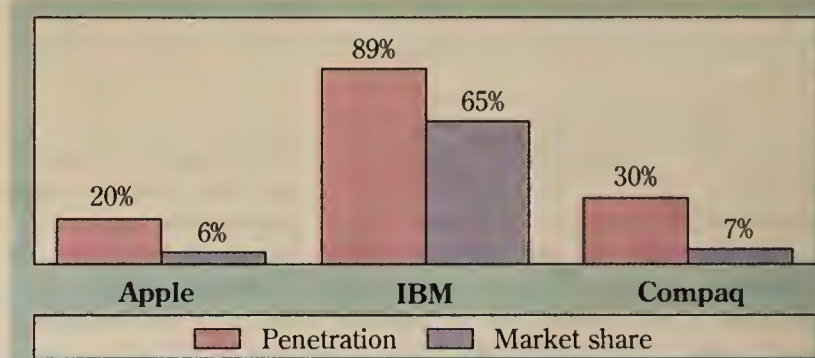
keting at Computer Associates International, Inc., said his firm has an optimistic view of the potential for Mac connectivity to DOS as well as to OS/2, Unix and the VAX environment. But CA is taking a wait-and-see attitude before marketing traditional business products for the Mac.

"We're poised and ready if Apple is successful, but we don't want to jump the gun," Kreysar said. CA, through its Cricket Software arm, has introduced enhanced graphics programs for the Mac — a safely established market. It has also identified and is meeting a demand for Mac accounting products.

In the meantime, Apple is already pointing the way toward another horizon. The company showcased six Mac-based interactive media products that were mainly targeted toward the education market. More importantly, Apple underscored its commitment to future media development by announcing plans for

## Foot in the door

The Macintosh has gained entry at 20% of Fortune 1,000 companies but has still gained only 6% of the PC business from them



SOURCE: COMPUTER INTELLIGENCE

CW CHART: DOREEN DAHLE

a standardized media-device interface known as Apple Media Control Architecture.

The architecture's core interface code will make it easier for applications developers to integrate media devices such as videotape recorders, compact disk/read-only memory (CD-ROM) units and videodisk players into the Macintosh environment. The specifications are slated to be available by year's end.

"This growing effort to inte-

grate media is intended to get people out of the passenger seat," said Apple Products President Jean-Louis Gasse. "We want them to say, 'I can do this myself.'"

Microsoft Corp.'s recent announcement that its Office product for the Mac will be available on CD-ROM proves that the Apple interactive media thrust could pay dividends in the coveted business market as well as in the education arena.

# Getting DECed out and going to summer school

BY MARYFRAN JOHNSON  
and AMY CORTESE  
CW STAFF

PROVIDENCE, R.I. — Although no one had to write "The network is the system" 100 times on the blackboard, it was off to summer school for the sales force from Digital Equipment Corp.

"Digital University" is in full swing through the end of August as the firm reeducates a sales force that is confused and unable to keep pace with a barrage of new products. "Every six months there are new products, new features," said Mike Hadley, a DEC sales representative from Dallas. "I used to be able to quote a price on a configuration and fall within 5% to 10%. Today, I can't do that."

Networking, product positioning and whomping the competition are the hot topics in the humid summer air at Brown University's leafy Ivy League campus here.

After three days of intensive dawn-to-dusk training, discussion and pep talks, the salespeople go home armed with the ammunition to sell into hotly contested markets — such as transaction processing — in which they saw only moderate successes before. "We're being beaten in sales situations" because the sales force often lacks

vital information on the competition as well as its own products, said one exasperated sales rep.

For instance, Hadley recounted how he had just closed a sale pairing Oracle Corp. software with DEC hardware. "If I had known what I know now, I would have led with RDB," DEC's own database management system, instead of Oracle, he said.

Peter Smith, vice-president of product marketing, identified the three areas in which DEC's sales force most needed work: balancing the dual product line of reduced instruction set computing (RISC)/Unix and VAX/VMS, transaction processing and the desktop.

"We're saying to them: Here's the strategy, the depth, the direction and how it all plays with NAS [Network Application Support]," Smith said.

Competitive positioning was another major subject students were boning up on. "We know the competitors are out there, but what do their products do? That was always sort of nebulous," said Rose Quinn, a DEC sales rep from New Jersey. "Now we have some hard rules. We can look at the other products and do an evaluation."

Mark Hayward of Houston, another DEC salesman, agreed. "This brought all the information we need together in one place, at one time. It's informa-

tion to help us beat the competition."

One danger of such intensive training programs is oversaturating your sales force with data and expecting immediate returns, said Bob Randolph, an industry consultant at Technological Financial Services in Westford, Mass.

"It still takes a while for salesmen to get comfortable with selling a product," said Randolph, who predicts a six- to nine-month lag to gain that efficiency and comfort level with the new products.

Throughout the summer, some 6,000 salespeople will trade their business suits for book bags in 13 waves of 500 "students" each, grouped by the industry they sell to. "By bringing in salespeople within the

same industry, we're giving them a common denominator. They're learning from each other," said Peter Zotto, communications manager for manufacturing, engineering and marketing.

## Never before

This was the first time DEC ever briefed its entire sales force on unannounced products, he noted. The upcoming 9000 mainframe-class VAX was demonstrated along with other new and upcoming products, according to DEC.

All around the campus, the buzzwords were as thick as mosquitoes: Strategy. Solutions. Flexibility. Positioning.

Main themes during the sessions included finding solutions to the networking needs of customers and competing in today's

multivendor environment.

"We realize that most customer sites have a tremendous mix of equipment. Very few are Digital-only," said Peter Kobs, a DEC spokesman.

The bits and bytes of the new products were not what made the trip worthwhile, several sales reps agreed.

"The best thing about this is it helps us understand Digital's strategy," said Mark Scalzo, a sales rep from Texas.

Scalzo said he came away seeing his company as a network integrator. "We've transcended being a niche vendor to an across-the-board provider of everything from desktops to a mainframe in the 3090 class," he said. DEC's mainframe-class machine, the VAX 9000, will not make its debut until early fall.



# In the nick of time

An overlooked discount and a bit of confusion between a Digital Equipment Corp. salesman and the Church of Christ, Scientist nearly cost Gene Madden \$30,000.

Madden, the information services director at the church's worldwide headquarters in Boston, escaped the expensive error when he discovered his sales representative had missed a discount on a VAX 6000 Model 320. "It made me look like a hero to my financial folks," Madden said, adding that he learned of the discrepancy from an advisory service.

The church had initially purchased a VAX 6000 Model 210 last December, with plans to upgrade to a Model 310, Madden said. When the processing load became heavier than expected last spring, he decided to buy a Model 320. Although the order arrived one day before the April 30 deadline, the cheaper upgrade

price had been removed from DEC's on-line quote system.

"The salespeople never picked up on the fact that [the new prices] weren't there," Madden said.

When the IS director called his sales rep and told him about the \$30,000 discrepancy, DEC gave the church an additional \$30,000 off the discounted price.

"They may have been trying to make up for the fact that they almost shafted us, or they may have been so confused at that point they didn't want to do anything wrong," Madden said.

As the world headquarters for the Christian Science Church, Madden's 90-person IS shop runs a full range of financial systems in accounting, keeps track of membership and mailing lists worldwide and supplies office automation services.

MARYFRAN JOHNSON



# We Could Write A Book On Networking Your Business. For A Small Fee, We Will.

No doubt, you've considered networking your PCs. How can you avoid it? That's all you read about these days.

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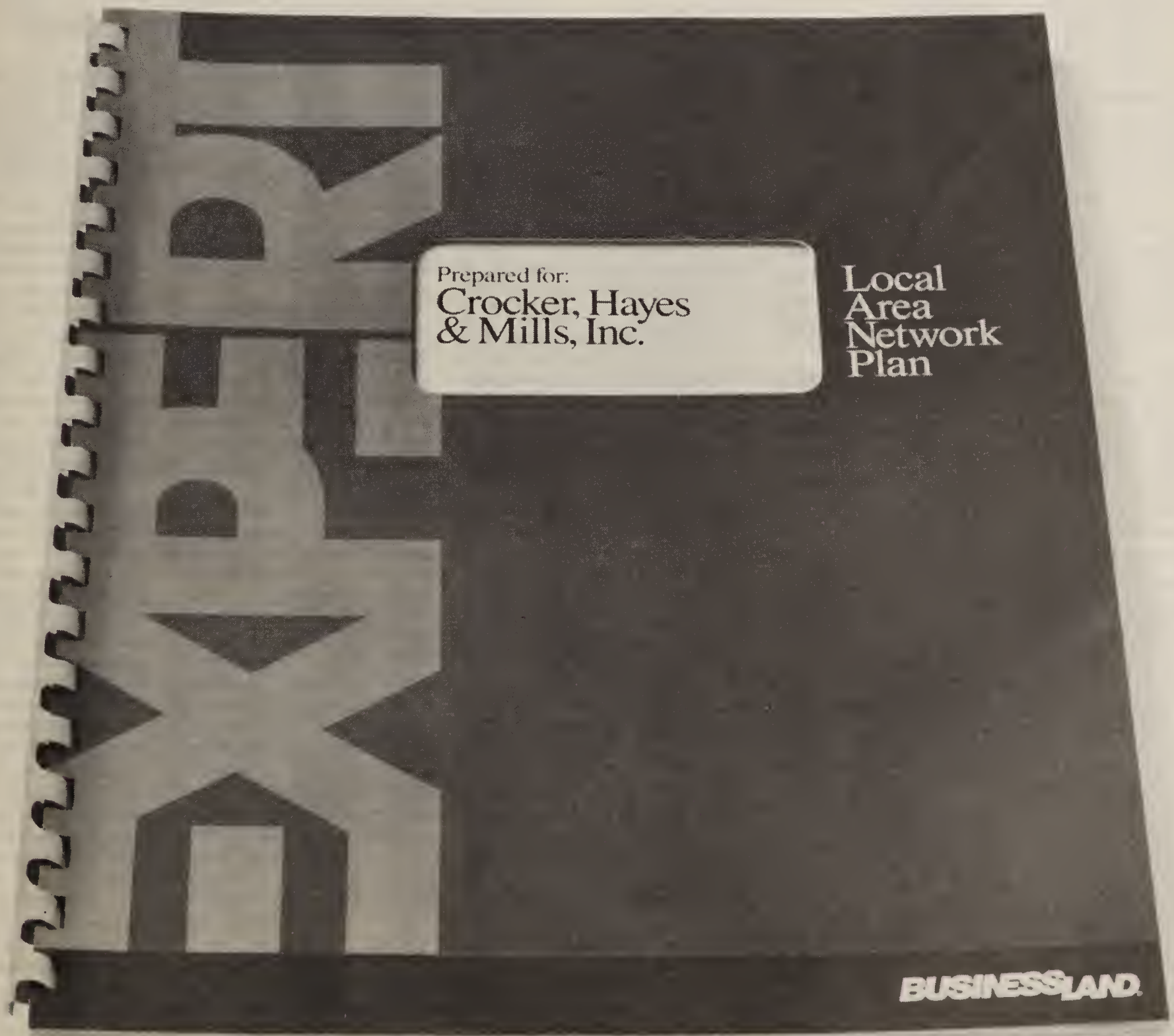
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## EDITORIAL

## Dynasty, Part II

*The question of how far one should go to maintain family control of a publicly held company is a delicate one.*  
An Wang, "Lessons"

**W**HEN THE FOUNDER of Wang Laboratories wrote these words three years ago, his company was still profitable and even showing signs of renewed life.

Last week the issue of family control at the company that was once king of the office automation heap was moot. A staggering \$424 million loss in its latest fiscal year pushed No. 1 son Fred Wang aside in favor of a miracle worker to be named later.

If nothing else, the move could result in a temporary halt in the erosion of customer confidence that has crept over Wang's ample installed base. But the question on the lips of IS managers, as well as their bosses who ultimately pay for capital outlays, is whether anyone can right a ship that has foundered so badly, gushing red ink the way the *Exxon Valdez* spewed oil.

To answer this \$64,000 question, consider what got Wang into the trouble it is in. No, it wasn't Fred's fault. If there's anything specific to pin on the younger Wang, it is the runaway expense side of the ledger that characterized his tenure as president and chief operating officer.

No, the problems run much deeper than Fred Wang — right to the heart of why some computer companies fail and others prosper. It is a formula that is so simple that ignoring it almost defies logic: Give customers what they want and need, and they'll reward you with sales and loyalty.

Wang has been woefully slow at jumping aboard the standards bandwagon being pulled by the user community. Other companies such as DEC and IBM were similarly reticent, but they were big enough to buck the standards trend, and in IBM's case, it set de facto standards.

Not so with Wang. The company that virtually owned the desktop in the early 1980s should have been a major beneficiary of the PC revolution and the general proliferation of information technology throughout the corporation.

Instead, Wang thumbed its nose at PCs, insisting on the terminal-to-host solution or cost-inefficient stand-alone word processors. And when Wang finally caught the PC wave, it did so with machines that were incompatible with the obvious standard set by IBM.

To be sure, the loyalty of Wang's minicomputer customer base remained strong. But what about the rest of the market, where future growth would be derived?

Wang Laboratories is not so far in a hole that it can't dig out. When you are in the shape the company is in, however, the cure may seem worse than the illness. Costs will be slashed by whatever turnaround maven is brought in. That must be done without damaging maintenance and support or product quality and without igniting a mass exodus of key staff. For those users that can afford to, adopting a wait-and-see posture might be the best course of action.



## LETTERS TO THE EDITOR

## Prime service

Your editorial, "Prime time" [CW, July 31], does a disservice to your readers and the shareholders, customers and employees of Prime Computer, Inc.

As a public company, Prime is subject to federal and state laws and the Securities and Exchange Commission (SEC). On Friday, July 20, six days prior to our scheduled annual meeting, MAI Basic Four, Inc. made a new offer to acquire our microcomputer business. The SEC requires that all relevant corporate information be circulated to shareholders in advance of voting.

Accordingly, as your own reporter accurately described it, the annual meeting was adjourned in response to the strong recommendation of the SEC. That recommendation was made on July 25, the day before the scheduled date of the meeting. There was no opportunity to inform shareholders of the adjournment. Consequently, the board decided to respond to the concerns and questions of those shareholders in attendance following the meeting's adjournment.

While the situation was regrettable, it was not of our making. Management and the board, throughout the tortuous nine-month takeover ordeal, has made every effort to best represent the interests of our shareholders, customers and employees.

Comments such as "sleight of hand," which question the integrity and motives of our board, are ill-informed and beneath the reputation you enjoy.

Anthony L. Craig  
President  
Prime Computer, Inc.  
Natick, Mass.

## Robert Morris: Hero or villain?

Regarding "Morris felony expected by end of July" [CW, July 17]: I believe Robert T. Morris Jr. should get an award!

I have worked with many organizations on basic security, backup and documentation issues. Almost every attempt at installing protective procedures has been killed by upper management due to cost.

I feel that *Computerworld* should recommend Morris for the Congressional Medal of Honor! I also feel CW should suggest that the security officers of Internet and the IS managers of the organizations involved be charged for gross management error and sent to jail.

The managers who cut security measures are the real culprits; by their inability to provide good security, they allowed the incident to happen.

It is my feeling that they are the ones responsible for the \$100 million in lost computer time and manpower. You should make every effort to point this out so that other IS managers, bean counters and top management can be put on notice for their own negligence for not providing resources to protect the network and the system.

Bill Fletcher  
Principal  
Software Showcase Consultants  
Cupertino, Calif.

Robert T. Morris Jr. could face a five-year sentence and a \$250,000 fine if convicted. What should we think about this?

Morris is alleged to have created the worm that impacted as many as 6,000 computers in November. The costs associated with lost computer time, restoring systems and files and labor

are certain to be in the millions.

If Morris broke into 6,000 offices, destroyed files and disrupted work, we would be appalled. Malicious behavior at that level would merit stiff fines and a lengthy jail term. Why should it be any different when the crime is perpetrated electronically?

If electronic commerce is to flourish, the sanctity of the electronic workplace must be protected as much as the sanctity of the physical workplace. We did not tolerate the Luddites smashing factories during the Industrial Revolution, and we must not tolerate the hackers crippling computers today.

Hackers are small-minded, mean-spirited and cowardly. They are often motivated by some kind of perverse pride. They fail to respect the economic cost, intellectual effort and honest toil of the hard-working people whose work they maliciously damage. Hackers do their dirty deeds at a distance; it takes more courage to throw a rock through a window and run away than to hack hidden behind an invisible computer network.

Hackers are worms in an electronic society. They merit our contempt and should be punished to the full extent of the law.

Walter Ulrich  
Information and Telecom  
Systems Section  
Arthur D. Little, Inc.  
Cambridge, Mass.

*Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.*





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  - 50. Business Service (except DP)
  - 60. Government — State/Federal/Local
  - 65. Communications Systems/Public Utilities/Transportation
  - 70. Mining/Construction/Petroleum/Refining/Agric
  - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
  - 85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
  - 90. Computer Peripheral Dealer/Distributor/Retailer
  - 95. User/Other
  - 95. Vendor/Other
- (Please specify)

2. TITLE/FUNCTION (Circle one)
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- 19. Vice President/Asst. VP
  - 21. Dir. Mgr. Suprv. IS/MIS/DP Services
  - 22. Dir. Mgr. Suprv. of Operations/Planning/Adm. Services
  - 23. Dir. Mgr. Suprv. Analyst of Systems
  - 31. Dir. Mgr. Suprv. of Programming
  - 32. Programmer/Methods Analyst
  - 35. Dir. Mgr. Suprv. OA/WP
  - 36. Data Comm. Network/Systems Mgt
- OTHER COMPANY MANAGEMENT
- 11. President/Owner/Partner, General Mgr
  - 12. Vice President/Asst. VP
  - 13. Treasurer/Controller, Financial Officer
  - 41. Engineering/Scientific, R&D, Tech. Mgt
  - 51. Sales/Mktg. Mgt
- OTHER PROFESSIONALS
- 60. Consulting Mgt
  - 70. Medical, Legal, Accounting Mgt
  - 80. Educators/Journalists/Librarians/Students
  - 90. Others
- (Please specify)

3. COMPUTER INVOLVEMENT (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant
- A. Mainframes/Superminis
  - B. Minicomputers/Small Business Computers
  - C. Microcomputers/Desktops
  - D. Communications Systems
  - E. Office Automation Systems
  - F. No Computer Involvement

1. BUSINESS/INDUSTRY (Circle one)
- 10. Manufacturer (other than computer)
  - 20. Finance/Insurance/Real Estate
  - 30. Medicine/Law/Education
  - 40. Wholesale/Retail/Trade
  - 50. Business Service (except DP)
  - 60. Government — State/Federal/Local
  - 65. Communications Systems/Public Utilities/Transportation
  - 70. Mining/Construction/Petroleum/Refining/Agric
  - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
  - 85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
  - 90. Computer Peripheral Dealer/Distributor/Retailer
  - 95. User/Other
  - 95. Vendor/Other
- (Please specify)

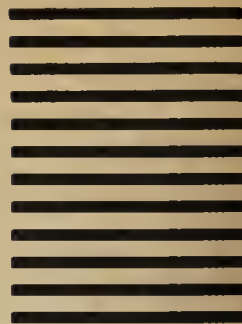
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  - 21. Dir. Mgr. Suprv. IS/MIS/DP Services
  - 22. Dir. Mgr. Suprv. of Operations/Planning/Adm. Services
  - 23. Dir. Mgr. Suprv. Analyst of Systems
  - 31. Dir. Mgr. Suprv. of Programming
  - 32. Programmer/Methods Analyst
  - 35. Dir. Mgr. Suprv. OA/WP
  - 36. Data Comm. Network/Systems Mgt
- OTHER COMPANY MANAGEMENT
- 11. President/Owner/Partner, General Mgr
  - 12. Vice President/Asst. VP
  - 13. Treasurer/Controller, Financial Officer
  - 41. Engineering/Scientific, R&D, Tech. Mgt
  - 51. Sales/Mktg. Mgt
- OTHER PROFESSIONALS
- 60. Consulting Mgt
  - 70. Medical, Legal, Accounting Mgt
  - 80. Educators/Journalists/Librarians/Students
  - 90. Others
- (Please specify)

3. COMPUTER INVOLVEMENT (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant
- A. Mainframes/Superminis
  - B. Minicomputers/Small Business Computers
  - C. Microcomputers/Desktops
  - D. Communications Systems
  - E. Office Automation Systems
  - F. No Computer Involvement





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# Blending IS execs and vendors

BY RONALD T. BRZEZINSKI



Ask any IS manager which technology vendor has the dominant control over his company's technology direction, and most will respond, "None of them!" Ask technology vendors the same question and many will answer: "The vendor who controls the network, the desktop or the mainframe controls the technology direction."

The responses indicate a glaring difference that exists between the two groups. IS managers have adopted an "I'll go at it alone" style, while some vendors are banking on the uniqueness of their products to control the IS department's technology direction. Deteriorating relationships between IS managers and vendors during the past several years are at the root of these differences.

My most memorable working relationship as an IS executive

Brzezinski is former vice-president of information systems at Quaker Oats Co. in Chicago.

was with an IBM sales representative during the early 1970s. From my perspective, it was a respect/hate relationship. I respected his wisdom, counsel and business maturity. I hated that he often had more access to senior business executives than I had.

At times, I seriously doubted his industry savvy because of his apparent unfamiliarity with competitive products and vendors. I later realized that this "unfamiliarity" was a sales ploy to instill doubt about the competition's viability.

What I remember most about him was that he knew the computing industry and his business. He knew our company's industry, organization and style. He knew how to talk with our business managers and executives. He knew how to sell and support our account. In spite of our occasional differences, we had a very productive working relationship.

The situation is very different today. Scores of technology vendors, many of them unfamiliar with the customer's industry and sometimes inexperienced in their own field, descend upon a typical IS department each year. Their objectives are to sell prod-

ucts or services or create "partnerships" (the latest fad).

The meetings usually begin with the vendor asking the IS manager to describe the depart-

ment's strategies, key business issues and the company's long-term business plans. Although these requests are intended to help the vendors be more effective, they are becoming an irritant for the IS manager. Most managers do not have time to repeatedly explain the business environment and direction to vendors who may be selling solutions for low-priority or non-existent problems.

The above scenario is reen-



JOHN BREakey

acted in IS departments across the country each day. Sales representatives who are not familiar with a customer's business environment often establish barriers

before they begin selling. Even after several visits, some technology vendors do not know who the IS department's key business users are or what the top IS priorities are.

These deteriorating relationships are harmful to both sides. Vendors spend unproductive time and resources trying to find business problems to fit their solutions. IS managers miss opportunities to capitalize on the vendor's corporate resources, contacts and knowledge, and they possibly overlook cost-saving alternatives.

## Time constraints

The goals of both the vendors and customers are becoming less achievable because of the IS manager's time constraints and the vendor's inexperience.

Vendor/customer relationships gradually weakened as the information technology industry's profile changed. A flood of new products, services and companies arrived on the scene during the last five years and provided more product choices and vendors for the IS manager to sort through.

As the industry changed the number of technology vendors, products, services and customers grew faster than the supply of experienced technology sales

*Continued on page 18*

## IBM 'business partners': Improvement or confusion?

### IBM WATCH

BY SAM ALBERT



For several years, information systems managers have acquired IBM systems and software from a variety of companies other than IBM. These companies were called remarketers, authorized dealers or value-added resellers. A year ago IBM changed all that, and now managers deal with IBM or its "business partners."

So what's in a name? These companies still sell IBM products and still possess applications expertise or other capabilities that managers could not obtain directly from IBM.

But there is more to IBM's designation of business partners than a change in terminology. IBM's use of the concept during the past year indicates that the firm has recognized that it can no longer supply all the information systems requirements for IS organizations. The firm now un-

derstands that software and services must come from a wide variety of other players as well as IBM.

derstands that software and services must come from a wide variety of other players as well as IBM.

The business partners concept grew out of IBM's awakening to some basic market facts:

- IBM's market share was not growing among small and medium-size companies.
- Software applications became the major driver in purchasing equipment.

**C**ONFUSION CAN BE lessened if managers understand up front how their requirements match the complex vendor relationships.

- Competitors were gaining ground in numerous niche businesses.

IBM had lost track of the hodgepodge of companies selling its equipment to the point where it could not determine its effectiveness in meeting its goals. In addition, the company needed to add more vendors to its ranks to combat these trends. IBM is us-

ing the business partner designation to set new guidelines for these companies. The partners can be divided into four groups:

- Complementary marketers who develop applications and earn fees when they participate in a hardware or software sale with IBM's sales force.
- Cooperative software suppliers who offer largely industry-specific applications and pay fees to IBM in exchange for sales representation by IBM or other business partners.
- Industry remarketers who occasionally make joint calls with IBM but work more independently offering midrange and personal computer hardware with value-added applications and support. They receive discounts on the IBM hardware and software they sell.
- Dealers who may or may not work with IBM sell mostly PCs and communications equipment with warranties.

It is clear that IBM made an astute business decision (also instituted by competitors such as Digital Equipment Corp. and Hewlett-Packard) by creating the business partner strategy. IBM finally saw that its sales force can't do it all. But what's in it for IS managers?

Many managers feel that the business partner concept confuses the issues of control and responsibility among the different companies involved in a sale.

The confusion can begin during the purchasing process. IBM

now has some 3,200 partners in midrange systems and about 2,500 in the Personal System/2 arena. Some of these firms work with larger systems as well.

In any purchasing situation, an IS manager may be confronted with a remarketer who offers lower hardware prices in conjunction with its software; an IBM direct salesman with coverage responsibility for his account; and complementary marketers with their own set of applications. If this beleaguered manager wants to include PCs in the bargain, the dealers may enter the picture as well.

The distribution of responsibility can become a major issue before, during and after the sale. Weighed against this problem are the benefits of choosing from an array of software and service options that meet specific needs; and selecting products from a host of companies who are backed by IBM, lessening the risk of dealing with small firms.

While the IBM sales representative is expected to solve the problems among the business partners, IS managers need to consider what their needs are and identify which firms, whether IBM, its partners or both, can best meet them. Confusion can be lessened if managers understand up front how their requirements match the complex vendor relationships.

Managers should ask themselves three basic questions to sort out the issues:

- What do you really need in both applications and systems support? IBM and its partners have varying qualifications. One can offer the right application but can't help with installation and support. You may want to work with more than one company to obtain all the services required.
- How are the business partners paid? Differences in the way the companies are paid can affect the deal. For example, complementary marketers receive fees, and savvy managers ask them to rebate a portion of the fees to be used to reduce the costs for overall services. Some companies are willing to do this because they are interested in future business.
- What do you need from IBM after the acquisition? Part of the answer to this question depends on whether you are more comfortable handing support responsibility to IBM and a complementary partner or remarketer or dealer.

Managers should demand clarity from IBM sales representatives in sorting out their requirements and bringing the best solution to the table. IBM's field organization has been beefed up with business-partner specialists who can help.

In pulling together the vendors which sell its products, IBM has widened its distribution channel. Now it is determined to help IS managers resolve the confusion that the business partner change has created.



## Brzezinski

FROM PAGE 17

representatives. The imbalance allowed less time for building relationships.

Several other industry changes contributed to the decline in vendor and IS relationships:

- Third-party vendors offering significantly lower prices, but

less support, became strong industry players. IS managers and full service vendors must recognize the differences and adjust their own working relationships accordingly.

- Profit margins of many technology products do not support a "relationship" sales approach. Some products such as desktop software are already in the commodity category and should be

approached as such.

- Confusion has increased in terms of who is the potential purchaser of products; Central IS, distributed IS or the business unit. This can cause a misunderstanding and hinder relationships.

- Technology acquisition decisions are being pushed too far down into the IS organization. Some senior IS executives are

trying to shed real or perceived "techie" images by allocating less time to the technology vendors. There is a danger that the IS executive may become dangerously out of touch with technology.

- The architecture craze has provided a crutch for some IS decision makers. Product alternatives or new technologies may be prematurely dismissed be-

cause they do not fit into a company's established architecture. IS managers must remember that an architecture is a planning framework and should remain flexible to accommodate changing technology.

Both sides have contributed to widening the relationship gap. Closing it will require both sides to take action. The following are a few suggestions:

**The Vendor:** Each vendor must determine what type of relationship it needs and can afford.

A few vendors have committed to rebuilding their IS relationships and have developed internal training programs to prepare their sales personnel. I was invited to participate in several vendor programs. My role was to explain what a potential customer expects from a technology vendor. My messages were simple:

- Know your industry.
- Know the customer's industry.
- Know the customer's culture.
- Prepare an account plan and share it with the account.
- Always keep the IS manager informed.

These suggestions are not complicated, but they require significant homework and diligence. The successful vendors of the future are actively doing their homework today.

**IS Management:** IS managers differ in their expectations of technology vendors. Some managers expect the vendor to be an extension of the IS department and encourage the sales representative to work with the company's business staff (I prefer this approach).

Other managers want to maintain very tight control over the vendor's business contacts and selling activities. IS managers should communicate their personal expectations to each vendor.

Regardless of the style differences, IS managers can help build stronger working relationships by doing the following:

- Maintain an open mind to new ideas and products.
- Work with the vendors to help them understand the business, using formal agendas to prevent wasting one another's time.
- Establishing account guidelines specifying how each vendor should conduct business.
- Communicating the guidelines to the IS department.

Professional briefing sessions, conducted by the key IS decision makers, will help vendors gain an understanding of the customer's business environment and priorities and help them perform more effectively in the account.

The "know thyself" rule applies to both the vendor and the IS manager in building strong and beneficial working relationships. Their expertise and knowledge must blend to benefit both groups.

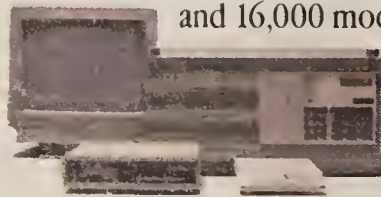
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# SYSTEMS & SOFTWARE

## S O F T T A L K

Stanley Gibson

### Annual checkup



Cincom Systems' annual user get-together, known as Cinteract, was a good time to take the pulse of the company and its user community.

In the wake of the Cullinet acquisition by Computer Associates, users are concerned about other database management system vendors such as Cincom. The company's belt-tightening measures earlier this year raised flags that the Cincinnati firm might be foundering on the same financial reefs that wrecked Cullinet.

Some users were complaining about employee turnover in the support department, which they believed was attributable to Cincom's April economies, calling for a mandatory month of unpaid leave for all employees. There were some gripes about what users perceived as a somewhat underdeveloped computer-aided software engineering strategy as well. "Mantis just isn't enough," one user said.

That's the cloud. Is there a silver lining? Cincom holds that its economies were taken as a conservative measure precisely to avoid the problems that ADR and Cullinet ran into. Company officials say the privately held firm is on track to make a profit this year.

In numerous sessions, attendees were told about new approaches for the future, such as

*Continued on page 28*

## Optical disks breaking ground

### ANALYSIS

BY J. A. SAVAGE  
CW STAFF

Optical storage disk makers are still grappling with technical issues endemic to the new industry. But dogging technical problems are not keeping the industry from forging ahead with new products for lower end systems.

Issues that continue to haunt the industry, according to Victor Jipson, program director at IBM's Optical Storage Laboratory in San Jose, Calif., include the following:

- Slow access times.
- High cost.
- Low capacity.
- Lack of an erasability feature for some products.

Jipson, speaking at the third Optical Drive & Media Manufac-

turing Technology Opportunity Conference last month in Burlingame, Calif., said that optical technology's good points — removable media and low sensitivity to head crashes — remain encouraging.

One major problem not addressed by Jipson is the durability of the media itself. "With magneto-optical, there is a tendency to oxidize and lose data," said David Herzberg, editor of "Optical Memory News," based in San Francisco. "The issue is, what kinds of yields and reliability will it have over time?"

Consultant Chet Mackentire of Camtron Technology Resources in Half Moon Bay, Calif., noted, "The components for drives are here, but the media is in a state of flux." Additionally, the cost of the media is a factor.

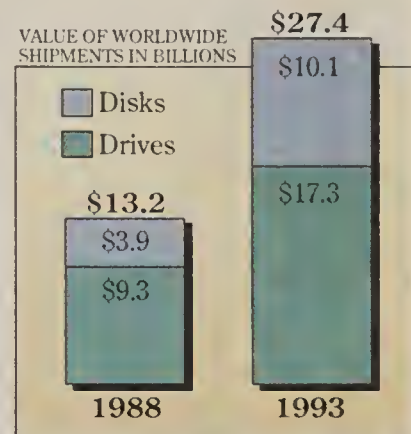
For 5¼-in. write-once disks, buyers pay approximately \$200

per disk; for 5¼-in. erasable disks, the cost is about \$300. For the upcoming 3½-in. drive, Mackentire estimates each optical disk will cost \$100. "Guys with PCs don't want to pay that," he said.

### Three-way split

In the last few years since optical has become a tangible product, the market has sifted into three segments. The first, and oldest, is that of large platter size, usually 12-in. media in write-once read-many (WORM) mode used for high-volume, mainframe-type storage applications. More recently, the action has been in 5¼-in. media — specifically in both erasable and write-once products aimed at midrange systems, largely in the imaging arena. The newest — and likely the largest — market will be 3½-in. drives.

**Seeing its way through**  
The emerging technology of optical storage is picking up speed; disks and drives should top \$27B by '93



SOURCE: BUSINESS COMMUNICATIONS CO.  
CW CHART: FRANK C. O'CONNELL

"The mass market for optical disk will be in 3½-in. for laptops and PCs," Herzberg said. "Two-inch is now being researched for fixed devices." He added that the major impediment to the 3½-in. drive is the lack of standards.

Indeed, after years of development

*Continued on page 28*

## Parallel tool holds commercial potential

BY ROBERT MORAN  
CW STAFF

Concurrent Computer Corp.'s recently introduced graphical software tool for restructuring parallelism in real-time Fortran programs may be the vehicle for achieving parallelism in commercial Cobol applications, according to its developers.

The Environment for Sequential-to-Parallel Processing (E/SP), which is scheduled for delivery in October, runs on the company's 3200 family of multiprocessing systems under its proprietary OS/32 operating system. But the company, which is based in Tinton Falls, N.J.,

claims that it will gear the software to run on commercial IS platforms such as Cobol.

According to Dennis Tinley, Concurrent's director of product marketing and planning, the company will bring the software to its RTU line of Unix-based multiprocessors at an unspecified time, followed by offerings on IBM, Digital Equipment Corp. and Hewlett-Packard Co. processors and languages such as C, Ada and Cobol.

Concurrent's plans are all achievable, said the software's developer, James Browne, a professor of computer science at the University of Texas at Austin and founder of Scientific and En-

gineering Software, Inc. in Austin.

However, Browne said that Concurrent has yet to contract with him to carry out those plans and that Concurrent has "an exclusive one-year license, and then we own the product." He added, "I would be eager to do Cobol because there are a lot of programs out there."

Like automated restructuring tools offered by most vendors of parallel processors, E/SP spares developers the task of sifting through massive amounts of code to find areas of parallelism.

But E/SP's differentiator, the company said, is that it guides users via pop-up windows and icons toward finer levels of parallelism that conservative compilers, for example, often miss.

Most technologies look for parallelism solely in loops, or sets of instructions a program repeatedly performs, Tinley

said. But E/SP can detect possibilities between loops and also offers automated fine-tuning — a step performed manually on other technologies.

According to Robert Cameron, associate director of technical computer systems at Dataquest, Inc. in Buxboro, Mass., E/SP's interface enables a programmer to look at a flowchart and — with a simple click of a mouse — explode the chart into the granularity of code. "It all boils down to higher speed of development."

*Continued on page 28*

### Inside

- Computers help Chicago reach for the sky. Page 25.
- Wang announces imaging contract. Page 27.
- Software AG doesn't want to be just another database vendor. Page 27.

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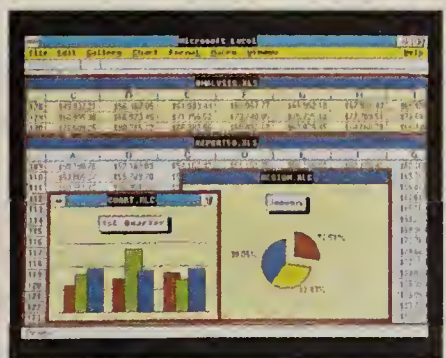
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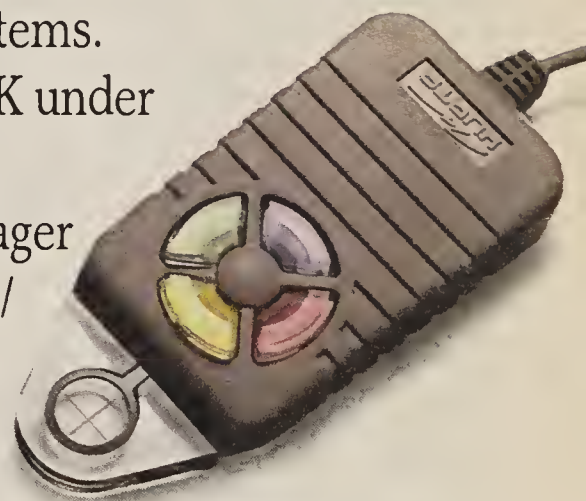
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Monitored System      Exceptions      Response Time      DASD Analysis
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1 CICS G1             [red bar]       [green bar]        [green bar]
2 CICS ZDS            [red bar]       [green bar]        [green bar]
3 MSA 23              [red bar]       [green bar]        [green bar]
4 TCICSOCS            [red bar]       [green bar]        [green bar]
5 MVS SYS1            [red bar]       [yellow bar]       [green bar]
6 IMS LA              [red bar]       [green bar]        [green bar]
7 IMS DB2             [red bar]       [green bar]        [green bar]

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(\*) **CURRENT DISPLAY** IMPACT of all tasks on UPDATE1

IPPO (AIRL BZOOM)

The largest impacter to UPDATE1 is TDT006 (T2952)

TDT006 (T2952)	37%
JES2 (Says)	8%
TDCL12 (T3180)	9%
TD0115A (T3080)	4%

UPDATE1

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0090 T2IANL TSURCS1... (PG=091), degrading %CISCIM
0090 T2IANLWT Set performance of TSURCS1 to 13
0090 T2IANLWT for 56 Seconds
0090 T2IANL
0090 T2IANL Primary Coolanders with %CISCIM
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<1>	TSURCS1	091	56	027%
<2>	%CISCMSA	055	54	007%

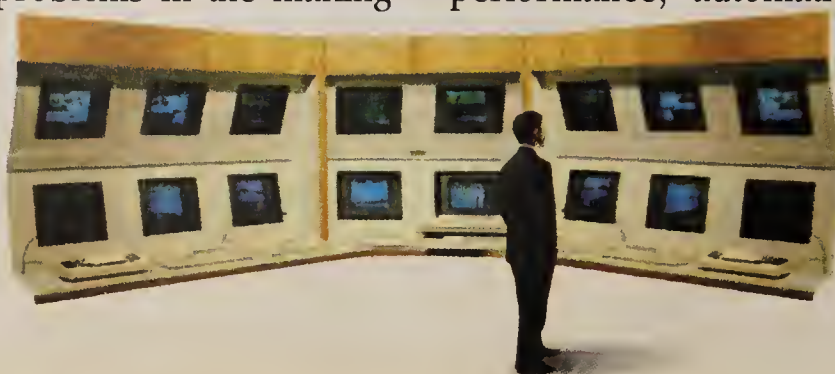
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# Computers help shape Chicago skyline

## ON SITE

BY ELLIS BOOKER  
CW STAFF

CHICAGO — Ever since the first *Australopithecus* stacked two rocks on top of each other, architects have been vying for the prize of the world's tallest building.

In this city, the competition has been especially fierce. Chicago, home of the first skyscraper, currently claims three of the world's five tallest buildings, including the tallest, the 1,522-ft. Sears Tower, built in 1974.

Now, predictably, someone else wants Sears' title. Chicago developers recently unveiled plans for a 1,914-ft., 125-story skyscraper — the rocket-shaped Miglin-Beitler Building.

Computers, including minicomputers and personal computers, are no strangers to architecture and construction firms, and they will be an important tool for creating this monumental struc-

ture. Computer-aided design (CAD) systems will help designers create models and print accurate diagrams; later, structural engineers will use specialized software running on minicomputers to calculate and model the complex interactions of the wind as it swirls around the building. But to start, designers say they prefer old-fashioned techniques.

"I work with paper and pencil. As far as the early creative end goes, we're still far more reliant on sitting down and conceptualizing, sketching and using three-dimensional scale models," said Greg Jones, an associate at Cesar Pelli & Associates, the New Haven, Conn., architectural firm that is designing the building for Miglin-Beitler, Inc.

However, computers are being used by the architectural firm to quickly create printouts of digitized versions of designers' sketches.

Pelli's office uses 10 stand-alone Compaq Computer Corp. PCs running Autocad from Auto-

desk, Inc. The Intel Corp. 80386-based PCs replaced a handful of IBM Personal Computer AT-class machines, which were outpaced by the requirements of the CAD program.

Like Jones, Cesar Pelli Associate David Chen said he believes computers have had the greatest impact on other architectural disciplines, particularly structural engineering. However, he said that CAD is useful for designers in automating repetitive tasks, such as drawing the outer wall — or skin — of a skyscraper.

"You design one bay of windows and then propagate this skin over the entire surface of the building," Chen said. Next, scaled versions of this surface are printed on Hewlett-Packard Co. plotters and glued to a cardboard box. This is an early idea of what the building will look like; designers can explore ideas by altering CAD drawings.

Another type of printout shows the building "in context," surrounded by representations of nearby structures.

A drawing generated by the PCs is the design development drawing. According to Chen, other architects are often called in to take plans for large projects and produce the contract document, the actual architectural plan for the builder.

Computers have helped this process, too, by sometimes allowing the various architects to exchange floppy disks along with hard-copy plans. This is made possible by the "layered" structure of most CAD systems.

If building designers have moved somewhat slowly to exchange pen and paper for computers, structural engineers long ago embraced the technology. But only recently have computers become powerful enough to provide truly flexible ways of

studying the complex forces of gravity, wind and weight that threaten to topple skyscrapers.

"The computerized analysis methods available in '74 are like a Model T to an SST," said Charles Thornton, president of Thornton-Tomasetti PC, the New York structural analysis firm working on the Miglin-Beitler Building.

In the 1970s, Thornton said, structural engineers were forced to "uncouple" East-West and North-South force analyses. Likewise, torsional analyses, which examine a building's twists in three dimensions, had to be very simple.

Today, Thornton's 150-person team uses dozens of specialized software packages running on a Digital Equipment Corp. VAX-11/750 and a VAX-11/780.

### In case of disaster

The minis subject a proposed design to simulated static and dynamic "forces," including hurricane winds and earthquakes. From these results, floors, walls, columns and wind-bracing are drafted — again using a computer. The 11/750 is used for analytical jobs; the 11/780, running McDonnell Douglas Manufacturing & Engineering Systems Co. GDS, is used for computer-aided design and drafting.

"We began using the computers five years ago," said Thornton, who noted that if all parties designing the building use a common software package, data can be transmitted over modem or exchanged via floppy disks between architects and engineers.

Thornton said computers also



Computer-designed Miglin-Beitler Building to compete with Sears Tower

have had an immense impact on wind tunnel analysis — still a de rigueur part of designing a tall building. In the wind tunnel, a scale model of the planned building — the Miglin-Beitler Building's model will be five to six feet tall — surrounded by other model buildings is buffeted by real wind, resulting in air pressure and vibration results.

"The tunnels in the '70s used mechanical sensing equipment, with as many as 1,500 pressure points filled with oil or water," Thornton said, noting that this method was rudimentary and data acquisition slow.

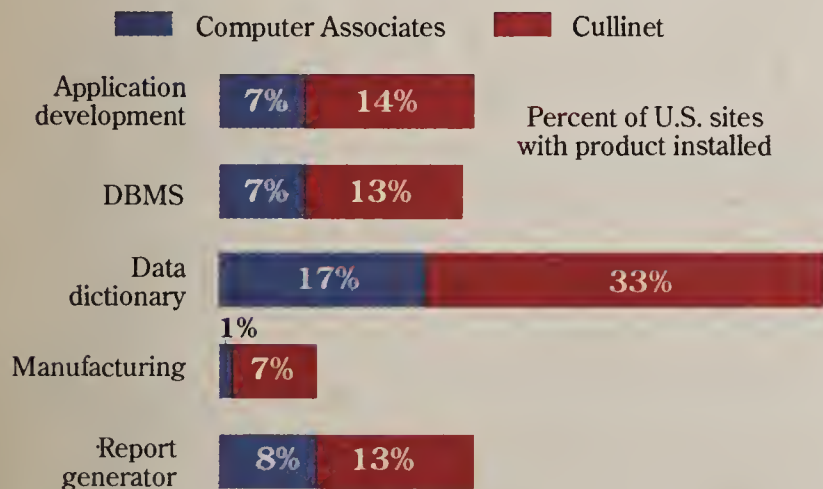
Current wind tunnels rely on microcircuits. And because the results from the wind tunnel study are digital data, this can be fed back into Thornton's computers to update the simulations conducted there.

While Thornton's engineers can watch a 3-D graphic of a wind-stressed building sway back and forth in real time, this sort of analysis is not very helpful to their basic job, that of ensuring the structural integrity of a skyscraper. "It looks great," Thornton conceded, "but you don't get much out of it."

## Data View

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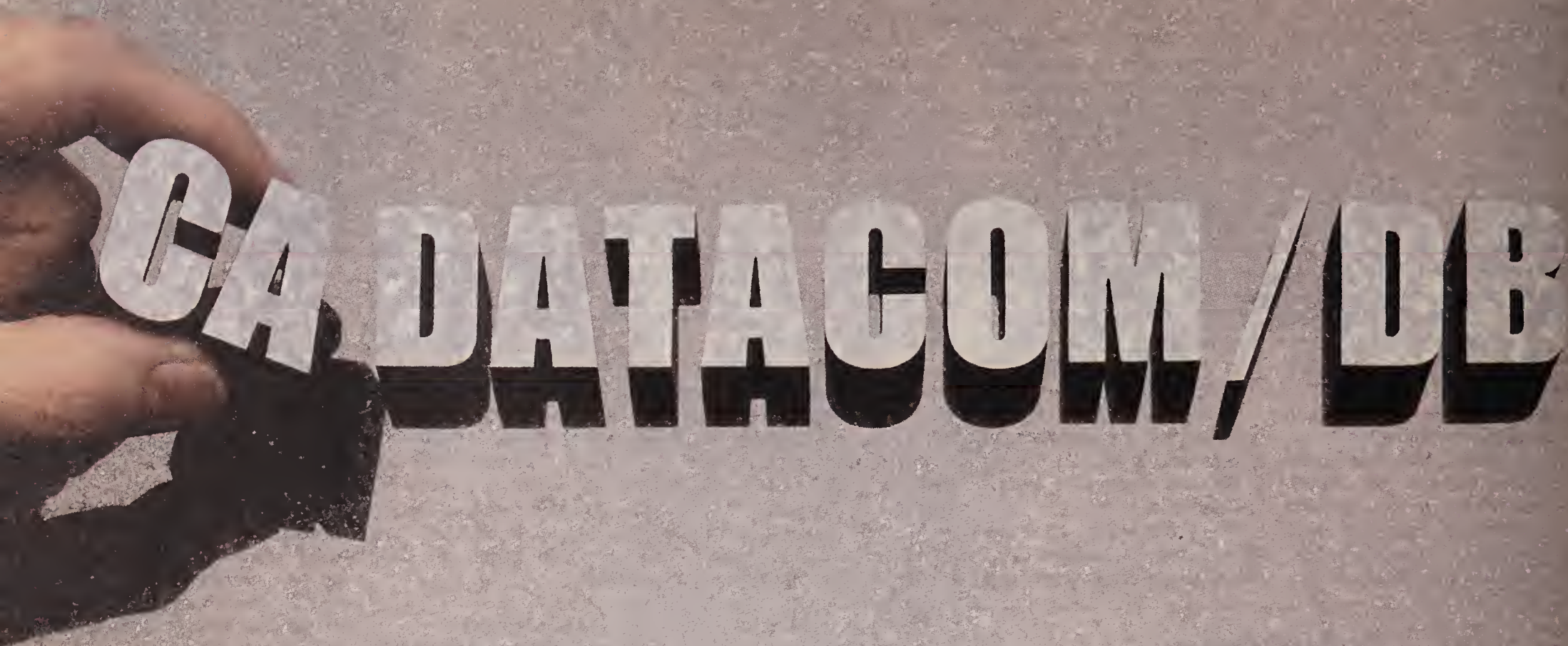
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## NEW DEALS

# Tulane picks Wang's image system

Tulane University in New Orleans said it selected the **Wang Laboratories, Inc.** imaging system to automate personnel records — Wang's first contract for its Wang Integrated Image System (WIIS) at a university. The school selected an entry-level version based on the Wang VS 5000 that costs \$150,000.

Wang also announced a WIIS sale worth \$1.2 million to the Florida Department of Education Bureau of Teacher Certification. The department will use the system to manage teacher certification records. It handles 20,000 new teacher files on an annual basis.

**Active Memory Technology** said the Imperial Cancer Research Fund in London has selected one of its Distributed Array of Processors massively parallel systems. The organization will use the system for research on genetic codes.

Deloitte, Haskins & Sells signed a \$2.3 million contract with **Bull H. N. Information Systems, Inc.** for new equipment at its Nashville data center. The equipment includes a DPS 90

mainframe, a page printing system and a disk subsystem. The accounting firm runs another DPS 90, which supports 44 Bull DPS 6 minicomputers.

**Unisys Corp.** won a \$5.5 million contract from the Methodist Hospitals of Memphis to install a patient-care system. Unisys will install an A series mainframe, the Unisys Professional Resource Network 2000 Patient Care Software and 130 Unisys PW personal computers.

The company also announced a deal with Holland Hitch Co., which provides machinery to the trucking industry, for \$3.7 million. Unisys will provide an A17 mainframe as well as manufacturing software.

**Systems Industries, Inc.** said the NASA Goddard Space Flight Center awarded it a contract that could amount to \$1.1 million over the next five years. The company will initially install 40G bytes of storage with its SI95C data storage subsystem with the option of installing an additional 60G bytes in the future.

**Stratus Computer, Inc.** sold

Mosaik, an XA 2000 Continuous Processing System, to Lufthansa German Airlines, which will use it to run its new cargo information system. Lufthansa plans to make the Stratus system available to other airlines. It will act as a message switch, providing two-way communications links between computers used by freight agents and airlines.

**IBM** was awarded a \$17.4 million contract from the Defense Advanced Research Projects Agency through the Naval Research Laboratory. The deal calls for IBM to develop X-ray mask manufacturing technology and a process to demonstrate submicron chips using X-ray lithography. The project will involve IBM's General Technology, Systems Integration and Research divisions.

Volkswagen of America, Inc. signed up with **Control Data Corp.'s** Technical Services Division for a three-year maintenance contract that will cost it roughly \$5 million. CDC will maintain IBM and non-IBM equipment for the automobile company.

# Software AG gears up line of end-user tools

BY AMY CORTESE  
CW STAFF

Software AG of North America, Inc. is trying to shed its image as just a database vendor. Over the last 12 months, the firm has unleashed an armful of new products ranging from a text management system to an Apple Computer, Inc. Macintosh-based computer-aided software engineering tool. Last week, the firm sought to expand its end-user offerings with new software tools for decision support.

Natural Spreadsheet, a mainframe-based spreadsheet, reads data from any database supported by Software AG's Natural fourth-generation language — namely, IBM's DB2, DL/1, VSAM and, of course, Software AG's Adabas. It is also compatible with Lotus Development Corp.'s 1-2-3 and Symphony. Natural spreadsheet supports unlimited spreadsheet size.

Additionally, an interface to the popular SAS statistical and graphics package was introduced. The menu-based product,

called Natural Statistical Link, will allow users to create SAS procedures or use a hot key to switch between a Natural Statistical Link window and an SAS System window.

## Additional platforms

Natural Spreadsheet and Natural Statistical Link are Software AG's first end-user tools to be released since 1985, when the company introduced Super Natural, its end-user reporting and information management system. Sara Wanderer, product manager for the end-user tools, said development is under way for additional platforms and links to other applications.

The new products will work as add-on components to Super Natural and will be shown as options on Super Natural's menu. Available this fall, pricing for Natural Spreadsheet ranges from \$2,750 to \$21,600, depending on size class. Likewise, Natural Statistical Link ranges from \$4,500 to \$24,000. A new release of Super Natural 2.3 is available now.

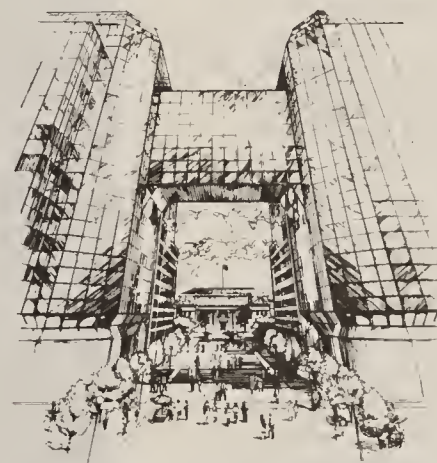
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Northern Telecom Inc. hereby gives notice that on July 24, 1989, the company announced a Manufacturer's Rebate Program for its Meridian SL-1 systems. The Manufacturer's Rebate Program offers rebates which are paid directly to the customer/end-user by Northern Telecom Inc. based on the following conditions:

- The Meridian SL-1 system purchased under this program by the Customer must be new (never before placed in service) and replace a specified Manufacturer's PBX, which is owned and in service with the Customer. The new system must be a factory order placed on or after July 24, 1989, and be delivered by December 20, 1989.
- The system must be sold at retail by a Northern Telecom Authorized Meridian Distributor within its authorized territory. Any system purchased from an unauthorized source or outside an authorized territory will void the rebate offer.
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- The replaced system common equipment (CPU/Memory) must be shipped within thirty (30) days of new system cutover to Northern Telecom Inc.
- Software associated with the replaced system must be returned to the manufacturer of that system and such return certified to Northern Telecom Inc.
- A claim form, must be completed in its entirety for each requested rebate, signed by an authorized representative of the Distributor and Customer and received by Northern Telecom Inc. within sixty (60) days of the in service (cutover) date of the new system for which the rebate is requested. Requests received after this cutoff date will be denied.
- Upon receipt of the rebate form, Northern Telecom Inc. reserves the right to poll the switch to determine the actual number of ports. The results of the poll may effect the total amount of the rebate awarded.
- "Port" is defined as a trunk, voice line or data line termination in a new Meridian SL-1 system. DTI/CPI cards count as ten (10) ports per card under this program.
- Northern Telecom Inc. reserves the right to refuse to grant a rebate in each instance in which incorrect information is submitted on the rebate form.
- No new Meridian system shall qualify a Customer for a rebate under this program if that system has been used to qualify the Customer for a rebate under any other Northern Telecom Marketing Program.

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Northern Telecom Inc.  
2100 Lakeside Blvd.  
Mail Stop A502  
Richardson, Texas 75081



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## Optical disks

CONTINUED FROM PAGE 21

opment, there is little standardization.

"As far as write-once, they've agreed to disagree," said Bob Katzive, vice-president of Disk/Trend, Inc. in Mountain View, Calif. "People are so disgusted with the whole business [of standards creation]" he said, adding that the market is too small to make a difference, so vendors are counting on specific features to sell a product. According to Herzberg, the International Standards Organization has a two-part standard for 5¼-in. optical disks and none for 3½-in. Again, there is a fight between two standards, discrete block or continuous, for 3½ in., said Katzive, who estimates 3½-in. drives will be available sometime in 1991.

The lack of industry cohesiveness can partly be blamed on the speed at which new developments are thrown into an already confusing arena. For instance, optical disk developers have been trying to

convince consumers for the last few years that they need WORM devices; yet now that the industry is gearing up for erasable drives, developers have to go back and convince their clients to go with newer devices, according to Jipson.

Instead of a clearly defined optical disk market, "where the momentum is in image storage and retrieval," Mackentire said, "the industry is still trying to compare performance with tape and Winchester drives."

Market projections are rosy, said Hitachi Ltd.'s Gerald Boudreau, director of marketing and business planning for the computer division. Optical drives will be in nearly 5% of the storage market in 1993. But for now, there are many unresolved issues in the fledgling industry.

## Parallel

CONTINUED FROM PAGE 21

velopment and easier identifications of discontinuities," Cameron said.

In runtime determinations, automated compilers, for example, cannot guess whether different chunks of code can run in parallel, said beta-site user Jeffery Katz, supervisor of real-time computer systems at Combustion Engineering's nuclear division in Windsor, Conn.

"Since software engineers know the runtime characteristics of a program, they can interact with E/SP, which lets them do things that are virtually impossible to do manually," Katz said.

Dick Hill, editor-in-chief of the "Spang

Robinson Report on Supercomputing and Parallel Processing" in Eugene, Ore., said he agrees, adding that Concurrent's biggest innovation is "E/SP's graphical interface and the way the developer is brought into the loop."

While E/SP brings programmers into the loop, Katz said that effective usage of the windowing system and the icons requires extensive training and that programmers must also understand cost-benefit ratios to judge the effectiveness of running aspects of a program in parallel.

The E/SP runtime system costs \$2,000 to \$4,000. Development systems are available for Concurrent's 5000 and 6000 series workstations at \$17,500 and at \$19,000 for Sun Microsystems, Inc. and HP's Apollo Division workstations.

## Gibson

CONTINUED FROM PAGE 21

making both Mantis and Supra object oriented. Cincom can stress its Netmaster network management software as well as its Control manufacturing software and Manage office automation software. The company says it is spending tons of money on research and development for all of these.

Thus, by diversifying and being on the leading edge of technology, Cincom can dodge the DB2 bullet.

The company is not alone in trying to pursue such a strategy. In fact, Cullinet was trying to do much the same thing before time ran out. However, there is reason to believe that Cincom will succeed where Cullinet failed. Cullinet tried to diversify when time was already short, whereas Cincom is already diversified. Cincom also has a DBMS that performs very well and is highly relational.

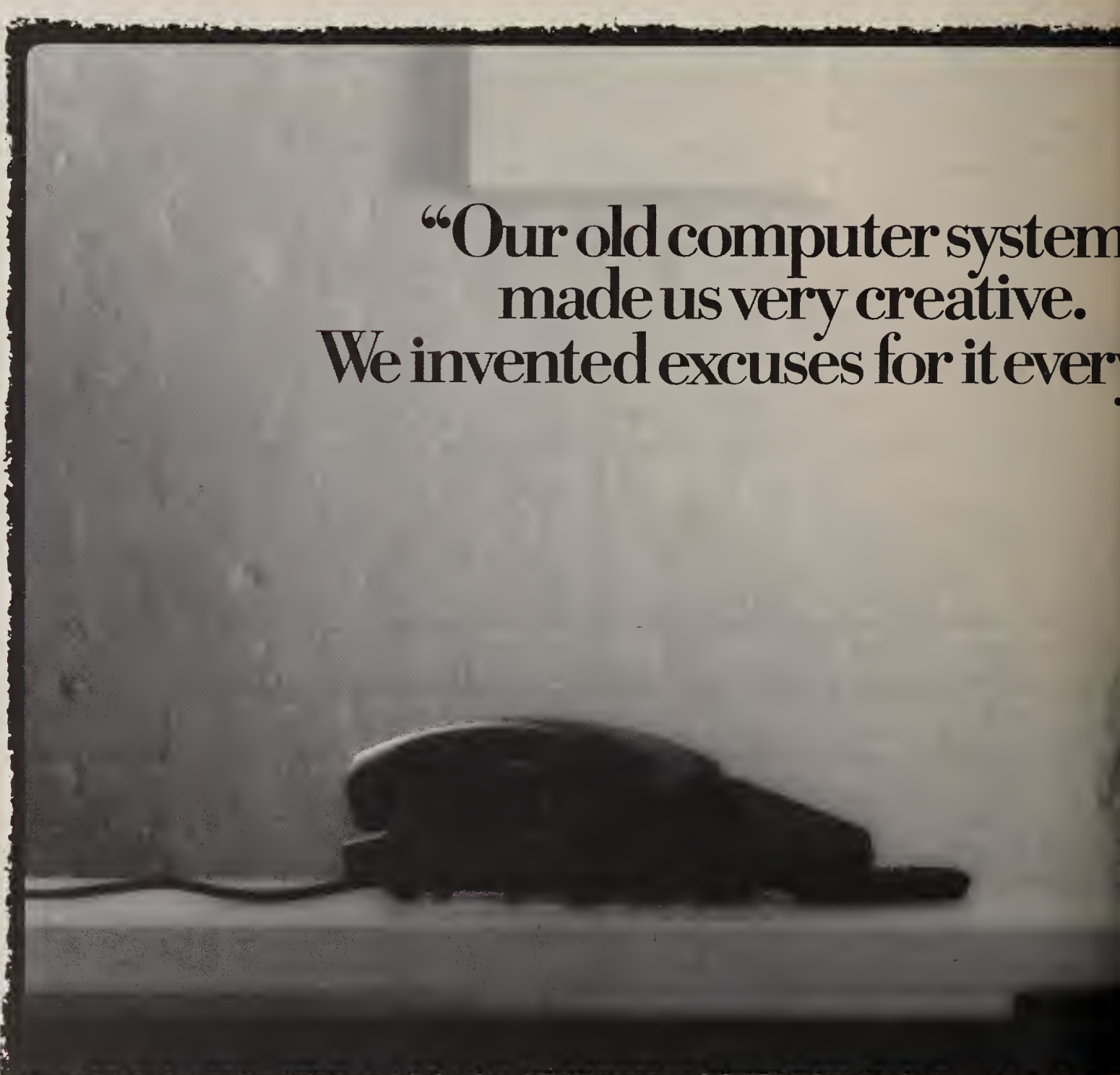
Most important, Cincom's users believe in the company, its products and in Chief Executive Officer Tom Nies. In their eyes, there is no sense that the company is floundering, as Cullinet was.

Cincom users have a right to be dissatisfied, however, with the way in which Cincom downplayed news about its belt-tightening. There is little question that customer support suffered as a result, and customers have a right to know why. Were it not for a report in *Computerworld* [CW, March 27], news of the economies might not have gotten out. Customers would then have seen a drop in service and wondered why.

The fact that the company is privately held is one reason for its reticence. Another is that the company sought to avoid a customer panic by not saying anything. But the world being what it is, word got out and customers were, if not panicked, certainly worried.

Cincom was awkward in addressing this issue. But that very awkwardness is something that its customers seem to understand — they don't expect a seamless facade. Said one attendee, "Cincom is not a marketing company. But they do take care of their users."

Gibson is *Computerworld's* senior editor, software.



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## NEW PRODUCTS — SYSTEMS

## I/O devices

Talaris Systems, Inc. has announced an optional add-on product for its 1590-T and 2492-B Printstation multiuser laser printers.

The add-on CCITT interpreter reportedly allows direct printing of documents that have been compressed in CCITT Group III or Group IV facsimile standard formats. No conversion software is required, the company said. The CCITT interpreter is priced at \$1,000 for the 1590-T version and \$1,500 for the 2492-B configuration.

**Talaris Systems**  
6059 Cornerstone Court W.  
San Diego, Calif. 92121  
619-587-0787

Fujitsu America, Inc. has extended its midrange scanner product line with an image scanner that can reportedly process over 25 page/min at a resolution of 200 dot/in.

Called the M3093, the unit is said to feature an optional image processing board that provides autodiscrimination, the capability for monochrome and 64 automatic levels of gray-scale imaging in a single pass. According to Fujitsu, the

scanner has a footprint of 21 in. by 15 in. and can automatically feed up to 50 legal-size documents from a standard hopper.

Scheduled to be available in October, the M3093 retails at \$5,650, and the image processing board costs \$1,400.

**Fujitsu America**  
3055 Orchard Drive  
San Jose, Calif. 95134  
408-432-1300

Goldstar Technology, Inc. has announced Model 1610 RGB, a 16-in. analog monitor said to offer compatibility with the IBM 8514A graphics display and support all personal computer-standard text and graphics applications.

The monitor includes a nonglare, dark-body screen, according to the vendor. It

reportedly displays 16 to 256 colors and 25 or 30 lines of 80 characters. It measures 14.6 by 15.7 by 16.5 in. on a tilt-and-swivel base.

It is priced at \$1,199.  
**Goldstar Technology**  
1130 E. Arques Ave.  
Sunnyvale, Calif. 94086  
408-737-8575

Printer Systems Corp. has introduced the Intelligent 218, an 18 page/min, 50,000 page/month laser printer that is based on an internal personal computer bus architecture and reportedly emulates the IBM 3812, the Digital Equipment Corp. LNO3 Plus and the Hewlett-Packard Co. Laserjet II. The unit offers 240 by 240 dot/in. and 300 by 300 dot/in. resolutions, the company said.

It is priced at \$14,395, with quantity discounts available.

**Printer Systems**  
9055 Comprint Court  
Gaithersburg, Md. 20877  
301-258-5060

## Data storage

Nemonix, Inc. has introduced a 4M-byte memory array for the Digital Equipment Corp. Decstation 3100.

The NX310-4 reportedly consists of two 2M-byte single-LU line memory modules and two double-sided, surface-mounted, 1M-byte, dynamic random-access memory CMOS memory chips. The design allows users to add expansion memory in 4M-byte increments, the company said, thereby supporting a maximum of 24M bytes into a Decstation 3100. The NX310-4 costs \$2,800.

**Nemonix**  
106 South St.  
Hopkinton, Mass. 01748  
508-435-9087

Ten X Technology, Inc. has announced a hardware device that reportedly enables optical write-once read-many (WORM) drives to be used on host small computer systems interface (SCSI) buses without operating system or application software additions or modifications.

The Optical Conversion Unit has read-only memory-based features that remap and link written blocks and perform all the indexing and data management functions required for the WORM to respond to the common command set of the SCSI Winchester disks, according to the vendor.

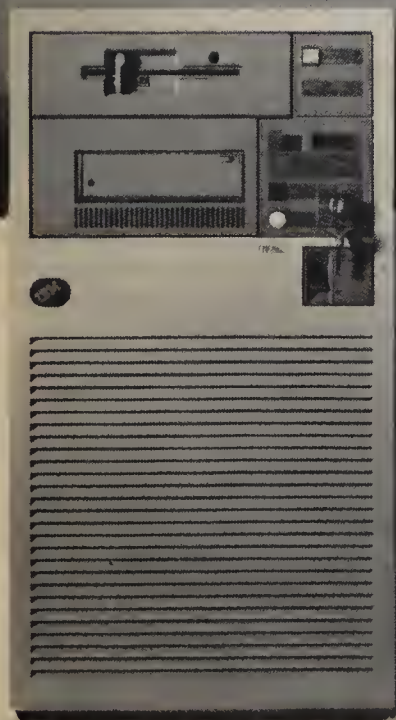
The half-height unit can be mounted internally in an IBM-compatible Personal Computer AT or externally in a standard peripheral enclosure. It is priced at \$1,295.

**Ten X Technology**  
Suite 3200  
4807 Spicewood Springs Road  
Building 3  
Austin, Texas 78759  
800-922-9050

Clearpoint Research Corp. has expanded its line with a series of memory upgrades for the Digital Equipment Corp. Vaxstation 3100 systems.

The DCME-M331 series offers 8M, 12M and 16M bytes of memory in stackable array cards, the vendor said. The cards reportedly connect to the Vaxstation 3100 CPU board using DEC's factory-installed connectors and are customer-installable.

List prices for the DCME-M31/8MB,  
*Continued on page 30*



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DCME-M31/12MB and DCME-M31/16MB are \$5,400, \$7,200 and \$9,600, respectively.

Quantity discounts are available.

The company added that the products are supported by Clearpoint's lifetime warranty and 24-hour replacement policy.

**Clearpoint Research**  
35 Parkwood Drive  
Hopkinton, Mass. 01748  
508-435-2000

## Power supplies

Meirick, Inc. has announced changes in technology, pricing and packaging for its line of uninterruptible power supplies (UPS), the company said.

Pricing of the Models 1000 and 1400 UPS devices has been reduced to \$795 and \$1,045, respectively. The units have reportedly been repackaged in a stronger tower design configuration to incorporate a removable battery drawer and provide a smaller footprint.

**Meirick**  
87 Hawn Drive  
P.O. Box 298  
Frisco, Colo. 80443  
303-668-3251

Nova Electric, Inc. has announced the Galaxy 1-kVA uninterruptible power supply (UPS) system for 19-in. rack-mount applications.

The UPS device reportedly provides 15 min. of power at full load from a built-in, sealed bat-

tery. The Galaxy design operates from shore power or from field generators with an input frequency range of 45 to 65 Hz. It measures 5¼ by 19 by 21 in. and weighs 108 pounds. The system and 10 units cost \$4,100.

**Nova Electric**  
263 Hillside Ave.  
Nutley, N.J. 07110  
201-661-3434



**Deltec's 7000 series of uninterruptible power supply systems**

Deltec Corp. has introduced an enhanced version of its 7000 series of uninterruptible power supply systems.

The 7000SCI is now capable of monitoring more system func-

tions through an expanded digital readout, according to the vendor. Other additions reportedly include a serial communication interface, keypad control and remote communications capabilities with both personal computers and mainframe systems. Prices (excluding batteries) start at approximately \$7,600.

**Deltec**  
2727 Kurtz St.  
San Diego, Calif.  
92110  
619-291-4211

NEC Electronics, Inc. has announced a series of capacitors for short-term battery backup of large current drains.

The FE Series Super Capacitors were reportedly designed to back up CMOS microprocessors and memory chips on personal computer boards, providing a capacitance range from 0.047 to 1.5 Farads. According to the company, all versions support up to one amp or more, operate at temperature ranges of -40 to 70 degrees Centigrade and can be

charged easily and quickly.

Pricing in 500-unit quantities ranges from \$2.80 for the 0.047-Farad to \$11.77 for the 1.5-Farad version.

**NEC Electronics**

**P.O. Box 7241**  
401 Ellis St.  
Mountain View, Calif.  
94039  
415-960-6000

## Processors

The Lynk Corp. has introduced Lynklyte, an IBM 3196-compatible workstation with a large, bright display.

The workstation reportedly features a 14-in. diagonal amber display with a flat screen to reduce glare, 2,080 characters, a character cell of 9 by 13 and a choice of keyboards with tilt levels.

A user-selectable key-ahead feature that allows keystrokes to be entered while "input inhibit" is active is also included, the company said.

Priced at \$1,095, a three-year warranty is included.

**The Lynk Corp.**  
101 Queens Drive  
King of Prussia, Pa. 19406  
215-265-3550

Star Technologies, Inc. has extended its series of 32-bit CMOS array processors with a unit said to be capable of operating at a speed of 150 million floating point operations per second.

The VP-3, part of the Vector Processor series, is based on a multiple instruction multiple data pipeline systems architecture.

The processor is capable of being stacked to provide addi-

tional processing power and contains a flexible I/O subsystem supporting data transfers up to 50M byte/sec., the vendor said.

Capable of connecting to various host computers, the processors can reportedly also be attached simultaneously as shared resources to as many as three dissimilar host computers.

The price of the system is \$115,000.

**Star Technologies**  
515 Shaw Road  
Sterling, Va. 22170  
703-689-4400

Digital Equipment Corp. has announced its Tempest line of hardware products.

The products include the Tempest Vaxstation 3100, a VMS workstation for government environments, starting at \$12,900, and the Tempest Microvax 3800, said to put VAX power in the open office area for under \$100,000. Further offerings include the Tempest Microvax 3600 for computer-room environments, starting at \$89,000; the Tempest VAX 6300, a midrange computer with expandability and BI I/O bandwidth; and a text terminal called the Tempest VT 320 that meets NACSIM 5100-A Tempest requirements. The terminal lists at \$1,995.

**DEC**  
111 Powdermill Road  
Maynard, Mass.  
01754-2571  
508-493-5111

## NEW PRODUCTS — SOFTWARE

### Languages

Cobalt Blue has announced the release of a dual-translation package to convert Fortran-77 to either C++ or C language on the Sun Microsystems, Inc. Sun-3 and Xenix/386 environments.

Named For C++, the package reportedly generates full C++ prototype declarations, optimizing the code for readability and ease of maintenance and preserving complex operations in their algebraic form. The Sun version is priced at \$2,250; the Xenix version sells for \$1,850.

**Cobalt Blue**  
Suite C  
2940 Union Ave.  
San Jose, Calif. 95124  
408-723-0474

Elliott Bay Computing, Inc. has released EQL, a natural language front-end processor developed for use with Information Builders, Inc.'s Focus for VAX 6.0 fourth-generation language. The software products run on Digital Equipment Corp. VAX computers.

According to the company, EQL, which stands for English Query Language, is capable of accessing any Focus database,

independent of where it resides, on a mainframe, minicomputer or personal computer system.

An EQL for the VAX is priced from \$770 on a Vaxstation to \$29,880 on a VAX 8840 that supports 100 to 150 users.

**Elliott Bay Computing**  
Suite 309  
200 W. Mercer  
Seattle, Wash. 98119  
206-286-8153

### Applications packages

Cadam, Inc. has upgraded its mainframe-based computer-aided design, manufacturing and engineering system, thus providing improvements to the numerical control tools.

Release 21.2 of Cadam reportedly addresses the needs of users in a computer-integrated manufacturing environment, allowing manufacturers to transfer design data directly from the designer's workstation to the numerical control machines on the factory floor.

According to the company, features include automatic profiling, a flange angle spline and a directional gouge checking and avoidance capability.

If bought directly from Ca-

dam, the system will have a price tag of \$15,000.

**Cadam**  
1935 N. Buena Vista St.  
Burbank, Calif. 91504  
800-255-5710

Quantitative Technology Corp. has upgraded its Ada version of a library of scientific and mathematical procedures.

According to the company, the reusable library, called Math Advantage, is divided into 15 packages including Basic Math, Full Unsymmetric Linear Algebra and Eigensystem. Provided in source-code form, Ada Math Advantage can run on a variety of computer platforms including systems from Cray Research Corp., Alliant Computer Systems Corp., Digital Equipment Corp., Hewlett-Packard Co. and Sun Microsystems, Inc.

First-year licensing fees range from \$2,000 to \$15,000.  
**Quantitative Technology**  
8700 S.W. Creekside Place  
Beaverton, Ore. 97005  
503-626-3081

Multitrak Software Development Corp. has upgraded its IBM mainframe-based IS project control system.

Multitrak MIS Release 2.5 has reportedly been designed to plan, track and control software development and maintenance

projects for all levels of an MIS firm. According to Multitrak, the system provides cost, schedule and resource information through a centralized data repository and features enhancements for time-card reporting, the ability to provide both on-line ad hoc summary reports and multiproject breakdowns, personal computer-to-mainframe communications and graphics.

Prices range from \$60,000 to \$250,000, depending on the number of users and options selected.

**Multitrak Software Development**  
108 Lincoln St.  
Boston, Mass. 02111-2502  
617-482-6677

### Computer-aided software engineering

Computer-aided software engineering has been made available for small systems and independent software developers by Visible Systems Corp.

Called Visible Analyst Workbench-Personal Edition, the product is said to include the flexibility and applications features found in the Professional Edition, except that it has been modified for smaller system developers with smaller projects. The product runs as a multiuser

tool on Novell, Inc. local-area networks or on individual personal computer workstations, allowing software engineers to simultaneously work together on projects.

The price is \$695.

**Visible Systems**  
The Bay Colony Corporate Center  
950 Winter St.  
Waltham, Mass. 02154  
617-890-2273

Computer Systems Advisers, Inc. has announced POSE-SRP, a screen report prototype module for the company's existing set of computer-aided software engineering development tools.

The latest module of the product reportedly enables system designers to develop prototype screen displays, reports and system simulations.

The program runs on IBM Personal Computers, XT's, AT's, Personal System/2's and compatible computers.

POSE-SRP carries a price tag of \$495.

**Computer Systems Advisers**  
50 Tice Blvd.  
Woodcliff Lake, N.J. 07675  
201-391-6500

On-Line Software, Inc. has upgraded its automated software development system by integration an IBM DB2 data dictionary



and supporting referential integrity.

According to the company, other Casepac Release 3.0 features include expanded object support, improved Data Dictionary Language generation capability, enhanced capabilities for graphics and a central repository for data definition.

Supporting Release 2.1 of IBM's DB2 and sporting compatibility with previous releases, a permanent license fee for Casepac under the MVS/XA operating system is \$200,000.

**On-Line Software**  
Two Executive Drive  
Fort Lee, N.J. 07024  
800-642-0177

Computer Resources and Technology, Inc. (CRT) has announced a service that will convert code from the IBM System/36 to native Application System/400, the company said.

The conversion reportedly allows AS/400 users to run existing System/36 programs in native mode. The converted programs compile at a smaller size than if they had been migrated and also offer a reduced execution time, according to the vendor.

Pricing is based on the number of lines of code targeted for conversion.

**CRT**  
20100 W. Greenfield Ave.  
Waukesha, Wis. 53186  
414-786-9171

A software testing service has been announced by Tiburon Systems, Inc.

The software development and systems integration company is now offering its internal testing methodology, called Omega Testing, for users of personal computers, minicomputers and main-frame systems.

The service is reportedly capable of testing operating systems, applications and other logic-driven programs, and it will be marketed directly to software developers.

Pricing ranges from approximately \$50,000 to \$100,000, depending on software complexity.

**Tiburon Systems**  
2085 Hamilton Ave.  
San Jose, Calif. 95125  
408-371-9400

Interactive Data Corp., a subsidiary of Dun & Bradstreet Corp., has expanded its collection of database offerings available through its Marketplus turnkey service.

Additional database services now include Morgan Stanley's Capital International Indices; the Global Vantage database from Standard & Poor's Compustat Services, Inc.; Institutional Broker's Estimate System; domestic and international databases from Lynch, Jones and Ryan; and the Exbond II database from Extel Financial Ltd.

Pricing begins at \$70,000 per year for U.S. equity pricing with daily updates on a Digital Equipment Corp. VAX 3000 series.

**Interactive Data**  
95 Hayden Ave.  
Lexington, Mass. 02173  
617-863-8100

## Utilities

Main Frame Software Products Corp. has modified a package that provides on-line Help facilities for IBM CICS users.

Help/Key 2.1 now reportedly features a data retrieval facility, a format summary

screen and a user exit program. It uses standard command-level CICS and is said to be compatible with all current releases of CICS running under the VSE and MVS operating systems.

License fees range from \$9,900 to \$12,900.

**Main Frame Software Products**  
1 Hollis St.  
Wellesley, Mass. 02180  
617-239-0288

VM Systems Group, Inc. (VMSG) has announced management software tools for the VM operating system.

The V/Manager set of software tools includes V/Spool, an active spool management system that emphasizes elimination of spool-related operational problems,

and V/Seg for DCSS management, which now includes migration/conversion aids for VM/XA SP.

A permanent license for V/Seg is available for \$8,950 to \$22,600 and for V/Spool at \$4,500 to \$23,050, based on the operating system version and group processor level.

According to VMSG, special introductory pricing and discount promotion are available for a limited time.

**VMSG**  
901 South Highland St.  
Arlington, Va. 22204  
703-979-3952

SAS Institute, Inc. has announced that its family of SAS/Access software products has been extended to include an interface

to Digital Equipment Corp.'s VAX RDB/VMS systems.

SAS/Access software is a modular component of the SAS System, an integrated software product for data management, analysis and presentation, the company said.

The interface for VAX RDB/VMS will reportedly allow users to extract data from an RDB table and put it into an SAS data set.

The first-year license fee for the interface ranges from \$475 to \$6,100, with renewals available at a lower rate.

**SAS Institute**  
SAS Circle  
Box 8000  
Cary, N.C. 27512  
919-467-8000



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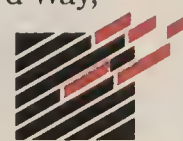
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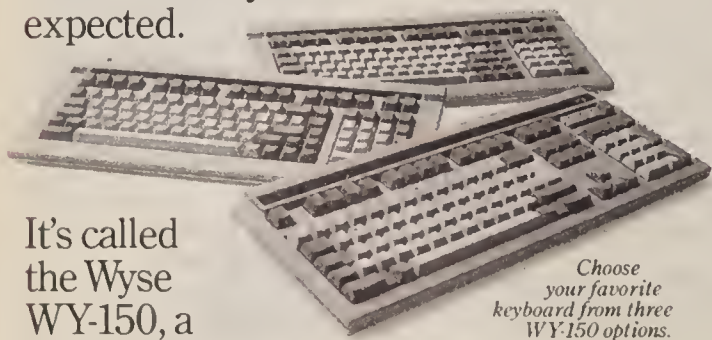


# The Terminal Of The '90s Has Arrived A Bit Early.

## Wyse introduces the WY-150.

They always said there would be such a terminal "someday". It would have the flexibility and connectivity to operate in virtually any computing environment, while meeting the most exacting ergonomic requirements. And, it would deliver those advantages at an affordable price.

"Someday" is here much sooner than expected.



It's called the Wyse WY-150, a breakthrough in terminal technology that will set price/performance standards for years to come.

Choose  
your favorite  
keyboard from three  
WY-150 options.

Bridging the worlds of ASCII, ANSI and PCs, the WY-150 offers compatibility with a wide range of operating systems. Including UNIX/XENIX, MS-DOS, Concurrent DOS, PC-MOS, and PICK. With a choice of three keyboards. And typical of Wyse, the WY-150 does it all with stylish design at a price that's also attractive.

The WY-150 also sets new ergonomic standards. Its 78 Hz refresh rate eliminates any hint of flicker. Just as overscanning and a bezel that matches the soft, paper white phosphor erase distracting borders. (Amber and green phosphors are also available.) The oversize 10x16 cell makes each crisp character stand out vividly.

The WY-150 is also part of *SystemWyse*. It links effortlessly with Wyse PCs and multi-user platforms to create uniquely

integrated and cost-effective solutions. Everything is designed, manufactured, and tested by Wyse to work together. And it's all backed by the service and support of the world's leading independent terminal maker.\*

Only one question remains. Now that the terminal of the '90s is here, what are you waiting for? Call today for more information on the WY-150.

## 1-800-GET-WYSE

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# PCs & WORKSTATIONS

## M I C R O B I T S

Ellis Booker

### From fancy to fact



"Don't fiddle with it, 007." That's Q, the grandfatherly technical wizard of the James Bond movies, talking about his latest gadget: a cigarette that shoots bullets, a fountain pen that fires a laser beam or a miniature helicopter armed to the teeth with side-winder missiles.

Along with bad actresses and villains with a preference for enormous subterranean laboratories, miniature marvels are a signature item of Bond films. His tiny, clever arsenal was the envy of my youth. Actually, I credit my own fascination with computers to the Bond flicks, in which Q's prototypes increasingly began relying on what, back then, was vaguely explained as "microcircuits."

Until recently, however, microcomputers haven't provided the diminutive proportions promised by the microchips they contain.

We would-be spies have had to choose between expensive, powerful and heavy (15 pounds and up) laptops or the venerable, inexpensive Tandy Radio Shack Model 100 or its successor, the Model 102.

*Continued on page 43*

## Users rate Lotus' 2.2 upgrade 'painless'

BY RICHARD PASTORE  
CW STAFF

Beta-test users of Lotus Development Corp.'s 1-2-3 Release 2.2 said they were impressed with the upgrade's ease of use, speed and added capabilities. But they complained about the new Undo feature's knack for devouring system memory.

Users were pleased and relieved by the release's short learning curve. "There was no training burden," said Nigel Chubb, manager of technical planning at Canada Post Corp. in Ottawa.

"The conversion from 2.01 is

totally painless," added Paul Brantley, vice-president of Micromentor, Inc., a Lotus-authorized training firm in Cambridge, Mass. Brantley said he was able to convert to the new version overnight.

Release 2.2, which began shipping late last month, is an enhancement of the 2.01 version that can operate within the 640K-byte memory limit of MS-DOS. Release 3.0 requires at least 1M byte of random-access memory and an Intel Corp. 80286-based personal computer.

Users who were interviewed agreed that the upgrade to 2.2

was worth the \$150 charge. The upgrade is free through December to users who purchased 2.01 after Sept. 5, 1988. Enhancements include overall speed, built-in Search and Replace, built-in add-in manager, Always publishing, Macro Library Manager add-ins and an Undo feature.

"It's easier to use than 2.01" because of the built-in add-in manager, Brantley said. "More importantly, it's a lot faster."

The Undo feature, which stores an exact copy of the spreadsheet in memory, allows users to take back a mistake and restore the file. "Undo is fantas-

tic," Brantley said. "If you're really zipping along and you make a mistake, it allows you to remove the bullet from your foot and back out of it really quick."

However, when working with large, complex files or the Always publishing add-in, Undo can slam users into the 640K-byte memory ceiling, users complained. "If someone uses Undo, they'd better not use Always because it won't allow you to undo your mistakes," said Sam Moeller, a PC specialist at a New York-based multinational trading firm.

A Lotus spokeswoman ac-  
*Continued on page 43*

## Siggraph demos expose business gap

BY RICHARD PASTORE  
CW STAFF

BOSTON — Walking into the Siggraph '89 computer graphics show held here earlier this month was like opening a door on a rainbow and stepping inside. Everywhere you looked, there were splashes of techno-color and computerized portraiture.

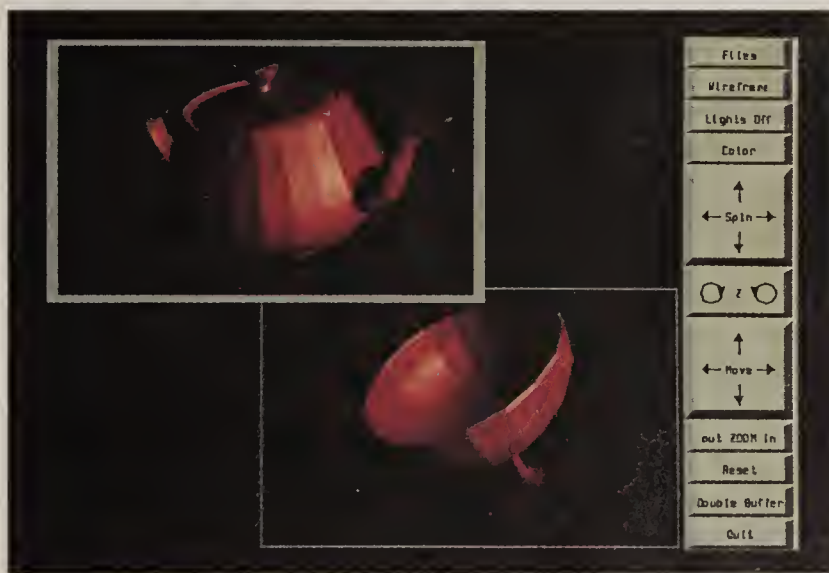
Granted, the technologies showcased at Siggraph may make perfect palettes for graphical artists, but what are they doing for business?

Not enough, according to keynote speaker Nicholas Negroponte, director of the MIT Media Lab. Computer graphics developers spend too much time trying to make realistic-looking teapots — one of which was featured in the Siggraph show logo

— and not enough time trying to enhance a user's ability to more naturally interface with machines, Negroponte said.

"Computer graphics are get-

ting so cheap that we will soon be able to put on people's desks what Evans & Sutherland now sell for millions of dollars," Negroponte predicted. "But this de-



MIT's Negroponte asks: "Do we need a better teapot?"

pends on graphics people moving toward [applications] that have to do with communication."

If you managed to dodge the plethora of public relations people trying to press pairs of 3-D glasses on you, you might have found some business-related product introductions, including the following:

- Allendale, N.J.-based Hitachi America Ltd. announced a 17-in. autoscanner that provides synchronization changes from 640- by 480-pixel resolution to

*Continued on page 44*

### Inside

- Reviews of the latest from Wordstar and Macromind. Page 35.
- Apple bid in federal market is a small win. Page 41.
- CD-ROM takes another significant step. Page 45.

## Can Micro Focus COBOL/2 Workbench improve the productivity of your CICS Programmers?

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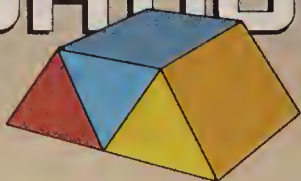
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## PRODUCT REVIEWS

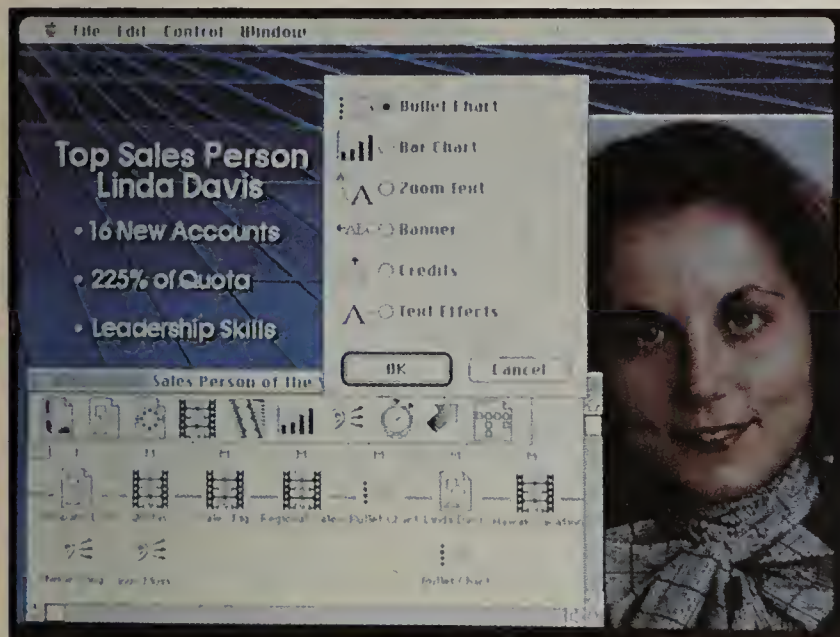
### Macromind Director for the Mac adds animation

Macromind, Inc.'s Macromind Director for Apple Computer, Inc.'s Macintosh lets you create slide shows with animated text as well as detailed animations. Common uses include business presentations, training and trade show product and company demonstrations.

The product has two major components called Overview

movie clips, accelerated movie clips and auto-animated text or bar charts. TIFF and encapsulated Postscript formats are not supported. There are icons for sound effects, transitions between scenes and an automatic timer. You can also combine Overview files into a single presentation.

To create a presentation, you



**Macromind Director** experience helps

and Studio. Overview controls the sequence and timing of a presentation that can contain graphics, sound and animated clips. Studio allows the creation of a series of frames that become animated scenes.

The Overview window has icons that represent the various sources that can be used to assemble your presentation. They include paint, PICT and Glue documents along with Director

drag the appropriate icons into position. As each one is moved into the region below the icon window, a dialog box appears so that you can indicate the document or effect you desire in the specified location.

After arranging icons, you use the playback panel to step through your presentation or play it in real time. You can overlay graphics with animation and

*Continued on page 37*

### Wordstar boosts word processor

Wordstar International's Wordstar Professional Version 5.5 continues a company tradition of enhancement by attachment. While keeping the basic word processing engine intact, the program has been enhanced with stand-alone modules that add new features without a major rewrite of the underlying program.

Wordstar 5.5 now includes a telecommunications program, graphics program, outliner and file-conversion utility. Many of the added features integrate poorly with the main program and require separate manuals, installation procedures and command logic.

Wordstar's telecommunications module has been optimized for use with on-line database services that are offered by CompuServe and includes the Xmodem and Xmodem-CRC file-transfer protocols with several terminal emulations. The telecommunications script language for automatic log-on, file transfer and log-off is adequate.

PC-Outline, a competent outliner from Brown Bag Software, is minimally integrated into Wordstar and uses a significantly different command syntax.

An add-on memory-resident program, Inset, provides reasonable graphics integration. Inset is very powerful with many features, but it only handles .PIX files created by using Inset to capture a screen.

It does not import any of the standard file types, limiting its utility in integrating the output of many graphics-compatible programs.

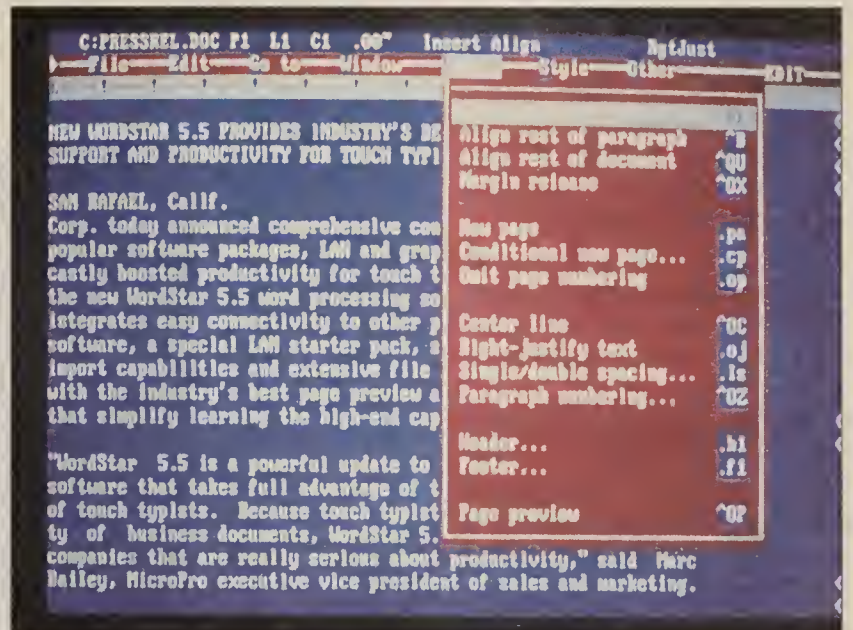
Compatibility is provided by Star Exchange, an add-on file

translation utility that translates between all standard formats.

In addition to its file-conversion capabilities, Wordstar imports Ashton-Tate Corp. Dbase

elements that can be inserted into a Wordstar document.

Wordstar 5.5 still lacks support for multiple indexes and lists, revision marking, editable



**Wordstar's Wordstar 5.5** adds a lot with little rewriting

files as well as Lotus Development Corp.'s 1-2-3 and compatible worksheets without conversion, using either entire sheets or named ranges.

Although still oriented toward the touch-typist, Wordstar 5.5 also features pull-down menus accessed by Alt-key combinations or a mouse. New to 5.5 is a paragraph style function that attaches a group of characteristics such as fonts, margins, justification and line heights to a paragraph and all subsequent paragraphs until the next style code is inserted.

These styles can be saved by name and attached as a group. The page preview feature has been enhanced to show landscape pages as well as graphic el-

side-by-side columns on-screen, footnotes in multiple-column text, headers or footers longer than three lines, sorting other than line sorts, tables of author-

*Continued on page 37*

#### Wordstar Professional Version 5.5

Price: \$495

- Performance: Good to excellent
- Documentation: Very good
- Ease of learning: Good
- Ease of use: Good
- Error handling: Very good
- Support policies: Very good
- Technical support: Unacceptable
- Value: Very good

## 6 Should a PC database server come with a single-user engine?

**YES.** Developers need to access their SQL databases without interrupting production applications. Gupta's SQLBase server comes in multi-user and single-user versions, allowing programmers the unmatched convenience of a complete SQL development system on their own PCs. Programs written in C, COBOL, SQLWindows or dBase-compatible code can then be installed on the PC LAN to access the multi-user SQLBase server. To learn the rest of the story, call the database server experts toll-free, 800-876-3267.



**We invented the SQL database server.**



# Folio Views can deliver on text retrieval

Folio Corp.'s Folio Views is an impressive text retrieval system that is based on a proprietary indexing system called "under-head indexing." For a text file to be accessible to Folio Views, you must import it to an "infobase" that holds both the compressed text and the index. Once your text is indexed, your searches — regardless of complexity — are executed almost instantly.

Each infobase is made up of folios, the smallest unit of text to be retrieved in a search. Without expanded memory, the maximum folio size is 10K bytes.

Although Folio Views includes a simple pop-up word processor for creating folios, the text usually already exists in sep-

arate files and must be imported into a new or existing infobase. Prior to doing so, you must manually prepare the text so that Folio Views can distinguish the component folios.

## Folio Views Version 1.3

Price: \$495

- Performance: Very good
- Documentation: Very good
- Ease of learning: Very good
- Ease of use: Satisfactory
- Error handling: Excellent
- Support: Good to very good
- Value: Very good

arate files and must be imported into a new or existing infobase. Prior to doing so, you must manually prepare the text so that Folio Views can distinguish the component folios.

A stand-alone program called Create is used to read the prepared text files and import them into an infobase or create a new infobase. The infobase can be edited on the fly, and you can add or delete folios at any time. Newly added folios are indexed immediately, and existing folios do not need to be reindexed when you make additions. The only limit to the size of an infobase is the storage medium.

The program provides a comprehensive set of search tools. A scrollable list of every word in the infobase appears in a separate window. You can either type your search request or hit Control-Enter to move the current word from the list down to the search line.

The results of each search appear in a window and are called a view. You can have as many as 10 views displayed at once, and you can save named views. Two or more named views can be combined in a search request. The result is a new "intersection" view that contains elements common to the views.

The real power of Folio Views is its ability to create cross-referenced links in hypertext fashion. You can insert a cross-reference at any word in your infobase that can be used to jump to related text or explanatory notes in a view.

Folio Views' user manual is well-written, thorough and has a

good index. On-line Help is included, as well as an infobase that is basically an on-line manual. There is also a 235K-byte sample infobase that is used in the comprehensive 140-page written tutorial. A motivated user can learn this program thor-

oughly in one day. The most time-consuming aspect of Folio Views is preparing existing text files for import into an infobase and then re-editing them so that the text will word-wrap in the search and result windows. Those who use Folio

Views to access preformatted text provided by third-party vendors will be relieved of this burden. The program also has good error-trapping procedures to prevent data loss or accidental erasure of files. Free — but not toll-free — phone support is

available from 7:00 a.m. to 6:00 p.m. Mountain time, and the technicians are knowledgeable.

Folio Views is extremely fast and easy to use. It is best suited for applications in which you need access to specific small parts of files — not entire files. At \$495, it is ideal for on-line technical manuals, reference books, literary research and legal work.

"I caught it, I cleaned it,  
I put it in the oven,  
and it's working fine."

Alan Tompkins, Waldport, Oregon



# Wordstar

FROM PAGE 35

ities and sophisticated graphics integration. It offers better-than-average layout capabilities, a 100,000-word dictionary, an unlimited customizable dictionary and a thesaurus with 220,000 synonyms.

Font support includes soft

fonts of various types and a comprehensive printer driver list and font-width table modification program. Font changes are easy, and the page preview is made more precise by including screen fonts derived from the printer fonts.

Wordstar 5.5's documentation covers topics such as keyboard templates, installation, customization, printers and

monitors. There is a comprehensive on-screen tutorial and a separate set of lessons. Error messages are clear, on-line Help is reasonably complete, and the menu system is clear and effective, whether using the classic menus or the pull-down style.

You can install Wordstar and begin producing simple documents within an hour or so. However, learning the auxiliary mod-

ules greatly augments the ease-of-learning time line.

Once learned, Wordstar's basic word processing engine is remarkably easy to use. Some ease of use is diminished by the need to master the different keystrokes common to PC-Outline or the telecommunications module.

Wordstar always edits a copy of your saved file — never the

original file on disk. When Wordstar saves a file, it always creates a backup. Wordstar requires confirmation before abandoning a changed file. There is a single-level Unerase command.

Wordstar 5.5 has a 90-day money-back guarantee. There is a toll-free technical support hotline, a CompuServe special-interest group and extended corporate support.

## Macromind

FROM PAGE 35

sound effects.

In Studio mode, you add motion to your presentation by arranging graphics frame by frame. Graphics can be imported or drawn using Director's built-in paint program. Paint features include free rotation, perspective distortion and the capability to make gradient fills. You can color bit maps and fully control palette hues. You can also set transitions between palettes and cycle palette colors for special effects.

As graphics are created or imported, they are placed in the Cast window — a database of

### Macromind Director

Price: \$695

- Performance: Excellent to very good
- Documentation: Good
- Ease of learning: Very good
- Ease of use: Very good
- Error handling: Good
- Support: Satisfactory to excellent
- Value: Good

characters or drawings for your animation. You drag characters from the Cast window onto the screen background, which Director calls the Stage. At the same time, a reference to this character is placed in the Score window, which controls animation.

The Score can contain as many as 24 cast members on stage. It is used to control the tempo, the color palette in use,

*Continued on page 44*



Not that Alan Tompkins expected it to work. After all, his HP graphics plotter had spent three months at the bottom of the Alsea River in Oregon. Ever since it was stolen from his office.

"I washed it out with a garden hose, dried it in the oven and plugged it in," Tompkins said. "Much to my surprise, it sprang to life and started spitting out graphs and charts."

Even at HP, our products don't go through humidity tests quite this severe. But almost. Because we know that a dud printer or plotter can sink your operation in a hurry. So, in 1980, we set up a Total Quality Control program to reduce failure rates tenfold by 1990. And we're right on schedule.\*

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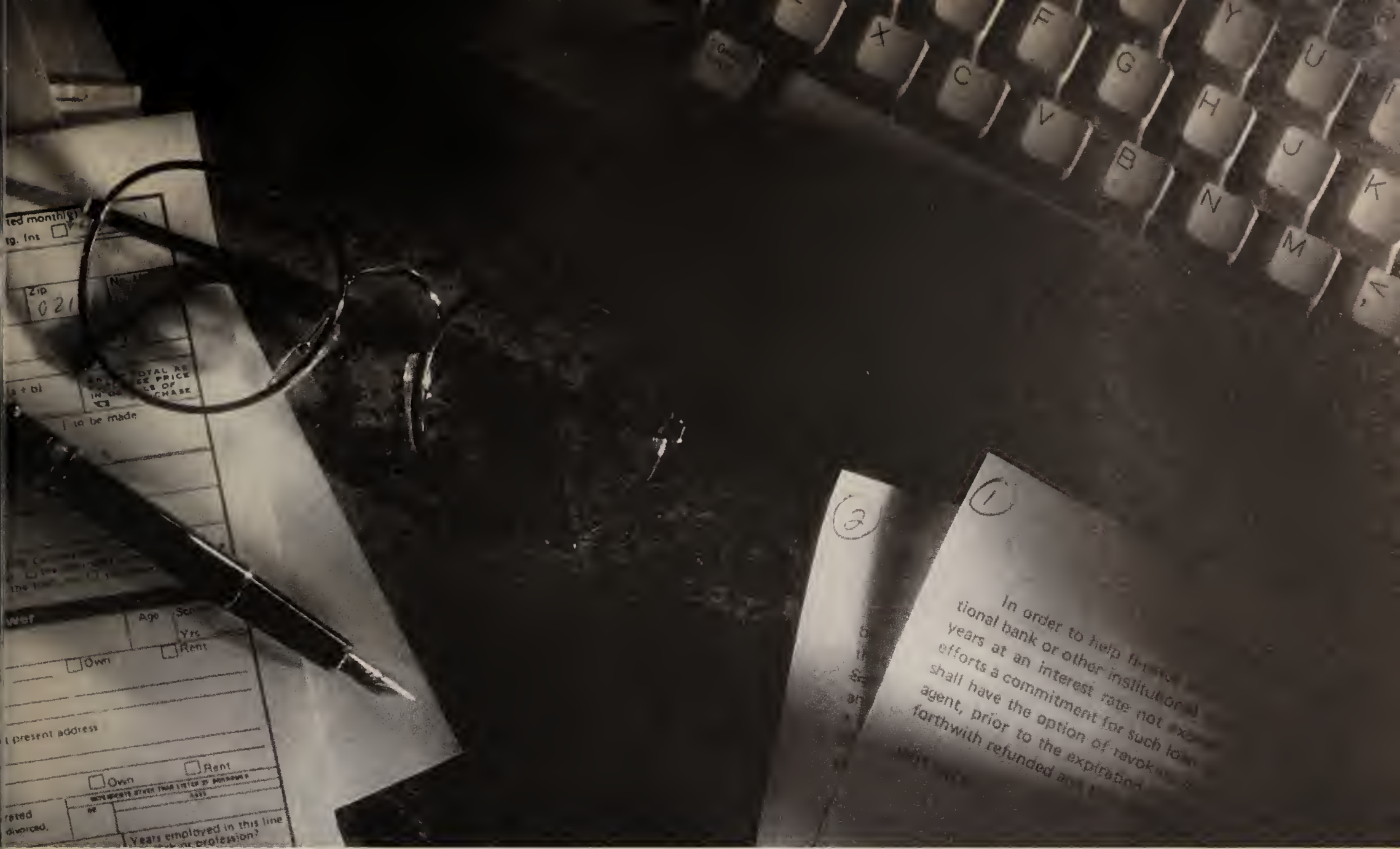


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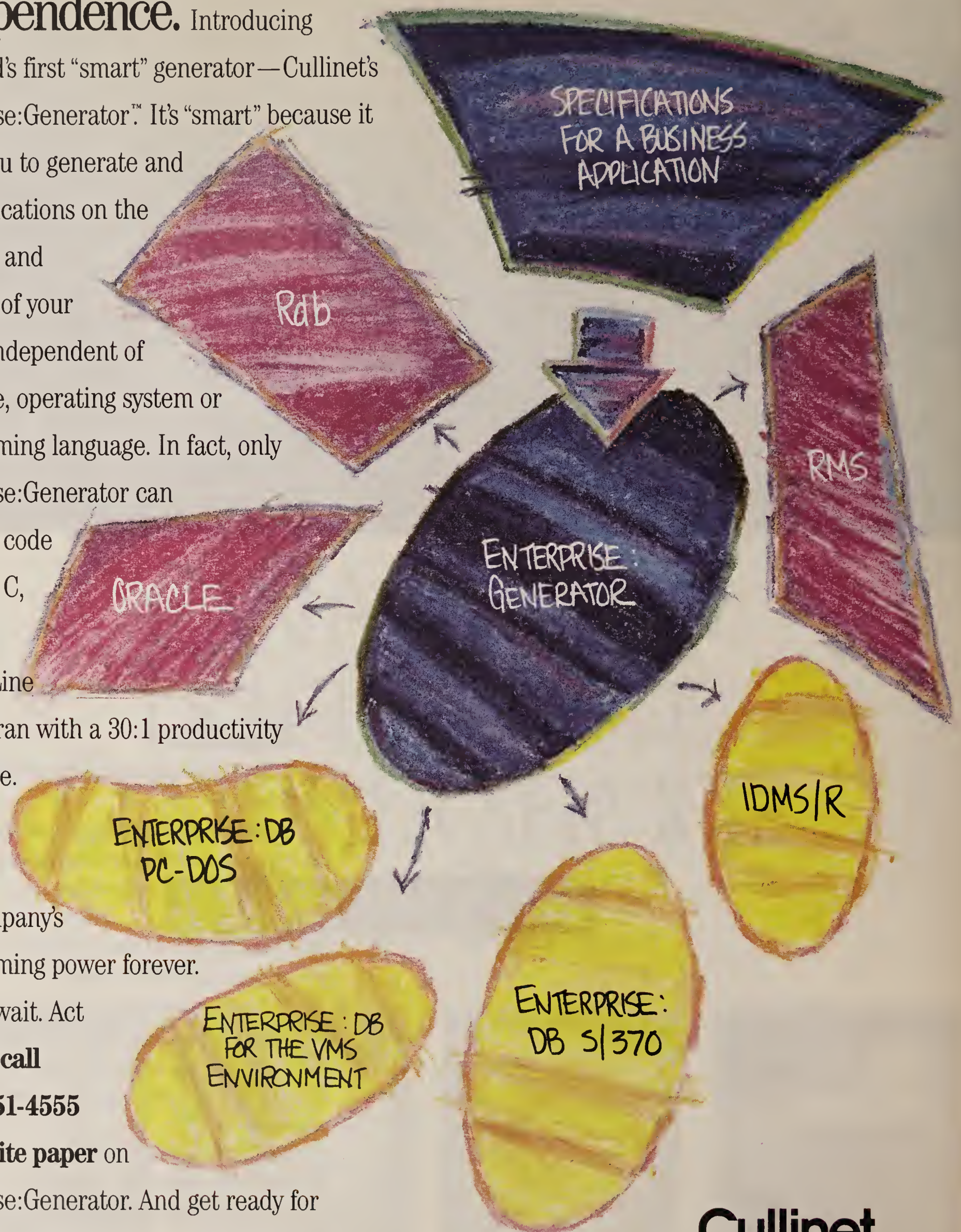
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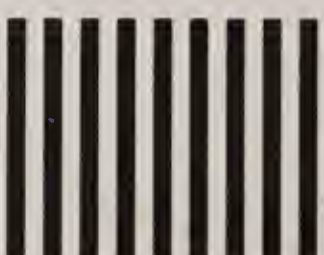
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# Post Office to sign, seal and take delivery on PCs

*Contract hailed as a big stride for Apple, Everex in federal market*

BY MITCH BETTS  
CW STAFF

WASHINGTON, D.C. — A U.S. Postal Services microcomputer contract awarded earlier this month represented a small but symbolic victory for Apple Computer, Inc.'s efforts to penetrate the federal market.

The Postal Service estimated that 600 Macintosh IIX microcomputers will be purchased under the contract — a small number by government standards — but one analyst suggested that Apple has finally found a way to get its foot in the door at federal agencies that have a bias toward IBM-compatible personal computers.

Ron Stultz, a federal market analyst at IDC Washington, Inc. in Vienna, Va., said Apple apparently had convinced the Postal Service to split its microcomputer procurement so that both Apple and IBM-compatible users could be served by agency contracts. In the past, most Macs have entered federal agencies through the back door [CW, May 8].

## Slice of a victory

"It's a victory for Apple's new strategy of getting agencies to recognize that they do have some Apple users — and some are reluctant to do that — and that those users should be able to buy Macs from an agencywide requirements contract," Stultz said.

He said that is a more realistic approach than trying to completely overturn the government's de facto standard in favor of micros based on Intel Corp. microprocessors.

The Postal Service awarded two contracts, together worth up to \$107.6 million, for use in stand-alone office applications and host-terminal emulation [CW, Aug. 7].

The competitive contracts were awarded to Apple's Federal Systems Group in Reston, Va., and Sysorex Information Systems, Inc., a Falls Church, Va.-based systems integrator that will supply IBM-compatible PCs from Everex Systems, Inc. in Fremont, Calif.

## A bite for Apple

Greg Shuk, acting director of Apple's federal group, confirmed that it was the first federal contract Apple has won as a prime contractor.

"If Apple is smart, they'll use this as a showcase for their federal efforts and urge other agencies to use the same strategy" of splitting their requirements contracts to cover both Apple and IBM-compatible products, Stultz said.

The Postal Service estimated

that it will order about 600 Macintosh systems and 14,000 Everex PCs during the five-year life of the contracts. Both contracts require the vendors to supply peripherals and technical support.

The micros will be used for typical office-automation tasks such as word processing, spreadsheets and desktop publishing as well as for dialing up host computers, Postal Service officials said.

Depending on actual orders, Apple's contract could amount to \$30.2 million, and the Sysorex contract could reach \$77.4 million, the agency said.

The actual number of micros to be purchased will depend on agency demand for the products listed in the so-called require-

ments contracts, which essentially are approved shopping lists and do not commit the agency to buying a certain number of units.

Apple's partner, Falcon Microsystems, Inc. in Landover, Md., is in charge of configuring third-party products, maintenance and support services for the Macs. The Apple bid included more than 25 subcontractors for peripheral products.

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\*Via 2604 Interface Feature



## Ashton-Tate, Odesta making smooth moves

BY MICHAEL ALEXANDER  
and JEAN S. BOZMAN  
CW STAFF

Odesta Corp. and Ashton-Tate Corp. are making connectivity and ease of use key elements of two recent updates of their software for Apple Computer, Inc.'s Macintosh computers.

Slated for release this month are Odesta's Double Helix 3.0 relational database and Clear Access, a graphical user interface for Ashton-Tate's presentation spreadsheet, Full Impact.

The products support Network Innovations Corp.'s CL/1 connectivity language, designed to enable users to access SQL-based relational databases on Digital Equipment Corp. VMS and IBM VM and MVS platforms. Network Innovations is an Apple subsidiary.

Both companies said that support for CL/1 will be offered when the connectivity language is available from Network Innovations later this year.

Earlier this year, Odesta announced support for CL/1 in its Geoquery visual decision support software.

Ashton-Tate announced two weeks ago that it had signed a licensing pact with Fairfield Software, Inc. for Fairfield's Clear Access graphically oriented database query tools, which includes support for CL/1.

According to the two vendors, Double Helix and Clear Access for Full Impact make extensive use of graphical interfaces that enable nontechnical users to create their own applications to tap DB2 and SQL/DS databases on IBM mainframes, as well as DEC's RDB and RMS Files systems for the VAX. The products also enable users to access Relational Technology, Inc.'s Ingres and databases from Oracle Corp., Sybase, Inc. and Informix Software, Inc. on distributed minicomputers, the two companies said.

Both companies also said that their products are aimed at sales and marketing professionals who often compile reports with graphs, presentation materials and other information that is derived from large corporate databases stored on mainframes and minicomputers.

Odesta planned to announce Double Helix Version 3.0 at last week's Macworld Expo in Boston.

"Users can extract data from more than one host DBMS and do a join of that data on their PC screen," said Michael Demeyer, director of marketing at Odesta.

Odesta, based in Chicago, tried to boost performance past that of the 18-month-old Double Helix 2.0, which has shipped to 45,000 users worldwide. The new software requires at least 1M byte of main memory and at least 1.5M bytes of hard-disk storage to operate efficiently, Demeyer said. It is available now for \$595, he added.

Clear Access for Full Impact will also be available this month from Fairfield Software for \$99. Ashton-Tate said that it will include a coupon for Clear Access in each package of Full Impact, which is priced at \$395.

## Microsoft spins Mac CD tool

BY JAMES DALY  
CW STAFF

Compact-disk storage technology got an important boost in its struggle to gain a foothold in the personal computer market earlier this month when Microsoft Corp. announced that a compact disk/read-only memory (CD-ROM) version of its popular Microsoft Office package will be available for Apple Computer, Inc. Macintosh systems by the end of next month.

The availability of the package — which includes Microsoft's Word, Excel, Powerpoint and Mail as well as documentation and multimedia segments — marks

the first time Microsoft's Office software will be available on CD for the Macintosh.

Although CD technology has been enormously successful with audiophiles, its relatively high price has kept it from finding widespread acceptance among general PC users. But analysts said the \$949 price tag on the new Microsoft product may go a long way toward changing that.

"Up until now, CDs had basically been limited to high-performance applications where cost is not the issue," said Michael Peterson, president of Peripheral Strategies, Inc., a research firm in Santa Barbara, Calif.

CD enthusiasts claimed the medium can store greater quantities of information, render better recordings than floppy or hard drives and offer quicker access to data.

Microsoft Chairman Bill Gates said the CD technology provides "a super medium" for delivering large amounts of information to computer users.

Some analysts warned, however, that some changes may still need to occur, specifically citing the \$1,999 price on Apple's CD player as too high for most general PC users.

Separately, Apple announced that it will incorporate its Floppy Disk High Density Superdrive into all Macintosh SE computers, as well as cut the list price of the SE by \$300.

# The ISDN

## Showcasing ISDN applications

BY JEAN S. BOZMAN  
CW STAFF

SCOTTSDALE, Ariz. — AT&T last week drew major computer vendors into its quest for MIS and telecommunications support for ISDN technology.

After years of preparation, AT&T is able to showcase Integrated Digital Network (ISDN) applications equipment from such mainframe vendors as Tandem Computers, Equipment Corp. and Wang Laboratories.

AT&T executives demonstrated

that gathers calls from multiple user locations — even those in an IBM Systems Network Architecture environment — can exchange

## ISDN applications come alive at ICA

Dawn Bushaus, Assistant Editor

Vendors at the International Communications Association convention last week showcased ISDN applications history when AT&T demonstrated a live

## ISDN STEALS SPOTLIGHT AT ICA SHOW

Twenty thousand people and more than 300 exhibitors are expected at the Dallas extravaganza April 30-May 5.

More than 300 exhibitors and an anticipated 20,000 people will flock to the Dallas Convention Center the week of April 30-May 5 for the 12th Annual ICA Conference. This year's show is

## AT&T To Let Telcos Offer Users Free ISDN

BY BETH SCHULTZ

SCOTTSDALE, ARIZ. — AT&T Network Systems last week said it will give its telephone company customers the chance to provide their users with free ISDN service on a trial basis.

AT&T introduced its Customer Opportunity Program at last week's NetPower '89 trade show here, which featured AT&T central office equipment and third-party supplied applications for integrated services digital networks (ISDN). AT&T Network Systems' new program offering that will

under which telcos are developing ISDN. Although AT&T's program was the centerpiece of the NetPower event, it was highlighted by Robert Cooper, executive director with Rochester, N.Y., said, "NetPower is essential to the telco and the telco is essential to AT&T."

Rochester Telephone Company interest in NetPower is a sign of its access to AT&T's ISDN switch. AT&T put together a team of experts to help telcos and end users how to use off-the-shelf products. "This is a way to explain to telcos and end users how the PC (local area network) more

BY BETH SCHULTZ

SCOTTSDALE, ARIZ. — AT&T Network Systems plans to showcase 11 new ISDN applications for telephone companies and business customers at the first NetPower '89 ISDN forum here this week.

Although AT&T is the past has been involved in ISDN, AT&T's own event — in different, an ISDN forum covering integrated services digital networks. AT&T spokeswoman said, "The company will highlight industry-specific solutions it developed in cooperation with local telephone companies and third-party vendors. Using off-the-shelf products, we will be demonstrating a PC (local area network) more

## An ISDN Opportunity EDITORIAL

When telephone companies and end users gathered in Scottsdale, Ariz., last week for the first NetPower '89 ISDN forum, they were looking for a way to get a firsthand look at what AT&T has to offer in the way of ISDN applications. They

## AT&T, others offer wide range of ISDN products at demo

By John Cox  
Senior Editor

SCOTTSDALE, Ariz. — AT&T last week demonstrated a battery of new and existing Integrated Services Digital Network (ISDN) products at NetPower '89, an exhibit

features such as Incoming Line Identification. Priced at \$995, the product will be available in April. NetLine, Inc.

## ICA ISDN Demo: NetPower '89 EDITORIAL

There was a lot of talk and, actually, a lot of action about ISDN at the International Communications Association convention in Dallas last week.

ICA ISDN Demo: NetPower '89 was the centerpiece of the convention. AT&T showcased its ISDN products and services. Bell Telephone Co. showcased its ISDN products and services. Some four hundred ISDN products were on display.

More than four hundred people attended the ISDN Demo. The demo was a success.

At times during the ISDN Demo, the audience was so large that it was difficult to find a place to stand. The demo was a success.

## AT&T To Spotlight 11 ISDN Applications

BY BETH SCHULTZ

SCOTTSDALE, ARIZ. — AT&T Network Systems plans to showcase 11 new ISDN applications for telephone companies and business customers at the first NetPower '89 ISDN forum here this week.

NETPOWER '89 PARTICIPANTS	
VENDOR	PRODUCT
AT&T	ISDN PC Terminal Emulation
AT&T	ISDN PC Terminal Emulation
AT&T	ISDN PC Terminal Emulation
AT&T	ISDN PC Terminal Emulation
AT&T	ISDN PC Terminal Emulation
AT&T	ISDN PC Terminal Emulation
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## Booker

CONTINUED FROM PAGE 33

The Tandys make up for their just-adequate LCD screen and DOS-lessness with long battery life, low weight and small size. According to an admittedly informal poll, Tandys remain the traveling companion of choice among the press corps.

But the dilemma of choosing between two flawed options is about to end. Earlier this month, Zenith Data Systems introduced the Minisport, a 5.9-pound Intel Corp. 80C88-2-based PC running at 8 MHz. The \$1,999 Minisport is the first real competitor to the \$2,999 Ultralite, a 4.4-pound PC that NEC Home Electron-

ics unveiled in October. The Ultralite uses a 16-bit NEC V30 microprocessor running at 9.8 MHz.

If the Ultralite and Minisport have pushed laptops into a new weight class, they've done so by rethinking some aspects of the PC and making innovative — some would say risky — design choices.

In the case of the Ultralite, NEC elected to do away with disk drives entirely, preferring to use a 1M-byte or 2M-byte "silicon disk" for storage. Zenith's engineers, apparently guessing that users do not entirely trust a static random-access memory disk to hold programs and data, went another, slightly heavier route: The Minisport comes with an unconventional 2-in., 720K-byte disk drive. The darling disks aren't cheap, though: a

box of 10 lists for \$99 from Zenith.

The market has yet to decide which approach it wants to take with notebook computers. Either way, the market is white-hot. According to Framingham, Mass.-based market research firm International Data Corp. (IDC), IBM-compatible laptops held around 12% of the microcomputer market in the U.S. last year, with 650,000 units sold. IDC predicts 850,000 will be sold this year and another 1.1 million next year. Among the notebook PCs, IDC projects sales of 50,000 this year but expects this number to triple in 1990.

NEC, for its part, says that it has sold about 5,000 Ultralites since October but is hopeful for much higher sales and is currently producing 3,000 units a month.

If the Ultralite and Minisport take up too much "desktop real estate" (a charming phrase), then consider the Portfolio from Atair in Sunnyvale, Calif.

Weighing in at just 1 pound, the Portfolio, which is scheduled to be available in September, uses a CMOS version of Intel's 8088 chip running at 4.92 MHz, making it slightly faster than the original IBM Personal Computer or XT. The diskless PC comes with 128K bytes of RAM (upgradable to 640K), a 40-column by eight-row LCD and a 63-key keyboard. Like the Ultralite, the Portfolio gets around a disk drive by using solid-state RAM cards, available in 32K-, 64K- and 128K-byte increments. Also, like the Tandy 102, it comes standard with several read-only memory-based applications — Lotus' 1-2-3-compatible spreadsheet, a simple text editor, address book, telephone dialer, appointment diary and programmable calculator.

Users can buy an optional serial RS-232C cable for connecting to peripherals such as printers or modems (there is no internal modem at the moment) or a smart parallel cable for transferring data to and from a desktop PC.

Notebook and pocket computers are arguably evolutionary — not revolutionary — products. On the other hand, consider the tremendous impact that the pocket watch had on society, when workers — and their bosses — were able to coordinate actions with minute-to-minute precision. I suspect a similar and subtle effect will occur as more and more of us tote PCs. Computers will become a basic part of one's attire, as essential and unextraordinary as a wristwatch.

Speaking of watches, remember Dick Tracy's...?

Booker is *Computerworld's* Chicago correspondent.

# Scorecard

## (Part 2)

### ty Calls

ign was started with little fanfare... significant information out of both... presented at NetPower... consultants, the press, all the... that ISDN is here... now. With its... and just getting the message out. The... put its money where its mouth is... is a risk. The Customer Opportu... AT&T visit-high in the ca... on trial more go back to plan old... offer ends. No matter the results, the... to ISDN. AT&T

the big users, and into... of ISDN... The ISDN R-Se... \$995 and is avai... Other vendor... to announce ISD... interface support fr... ucts. Among them... ware Link, Inc. of... which announced... an

### Feat

ISDN network creation, the... using the display must have... to be demonstrated wouldn't... could be glitches... network setup was winding down... problems. Microcom found... in Murrieta gear in the... the AT&T 5ESS switch that... ve been in Norwood, Mass... get the display burning an

### ions

announced... ISDN connect... ISDN company... ISDN service... with traditional... modern connections... the capability to... the way... an example of... several alternative... the spokesman said... Hermaker... ISDN... software package... ISDN... ISDN terminals... ISDN... system will be supervised by... the show provided by... lines provided by... telephone company... lines from the

## Who's really putting ISDN on the map? If you've seen the headlines, you know the score.

You only have to scan the trade press to see who's the clear-cut ISDN leader. The company that helped build the standards for ISDN. The company that's helping local telephone companies turn the promise of ISDN into Real-World Solutions. The company: AT&T.

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So, while most other suppliers are still in product development trials,

AT&T Network Systems is helping phone companies across the nation offer Real-World ISDN services right now. Services such as simultaneous voice and data transmission, high-speed facsimile and electronic mail — all over a single phone line. Services that utilize your existing telephone network to dramatically increase productivity and efficiency for businesses, from hospitals and insurance companies to investment, publishing and law firms.

### ISDN is just the beginning

We believe that ISDN is the beginning of an even bigger future. A future we call Universal Information Services. A future where networks will be able to meet complex communications needs for voice, data and image — simply and economically.

At AT&T Network Systems, this belief is already driving our technology, our product development, and our commitment to you.

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## Lotus

CONTINUED FROM PAGE 33

knowledge that Undo consumes a great deal of memory, but she noted that users have the option to disable the feature when working with large files or Allways.

With the off-sheet macro storage capability of the Macro Library Manager, users can write one set of macros and store them for future use rather than writing a new set for each spreadsheet.

"Finally, you don't have to write your macros just for one spreadsheet," Moeller said. "Over the long term, that will save us developing time, and we won't have to take up extra memory with duplicate macros."

Moeller, who tested both 2.2 and 3.0, had the option to commit to either. He said his company chose to go with 2.2 because of its shorter learning curve and greater number of currently available add-ins, especially Allways.

"Our decision was practical from a features standpoint; 2.2 had more features than we needed," Moeller said. If the new versions had been disappointing, he said, he was prepared to jump ship to the upcoming release of Borland International's Quattro.

Brantley also tested both versions and found favor with 2.2. "The conversion to 3.0 isn't painless, because to really take advantage of 3.0, you need to evaluate the way your spreadsheets are structured," he said.



# NECIS promises 486, EISA on the desktop

BY PATRICIA KEEFE  
CW STAFF

BOXBORO, Mass. — NEC Information Systems, Inc. (NECIS) is expected to fill out its desktop computer line in the next six months with both a 33-MHz Intel Corp. 80386 personal computer and a 486 offering — both using the Extended Industry Standard Architecture bus.

"It's a virtual certainty that we'll have [both of those] announced before year's end," said Richard Miller, director of entry systems marketing. "We think machines at that level of performance need a 32-bit bus."

There is a strong demand for 33-MHz 386 boxes, which are particularly suited for server or power-user applications, Miller noted. Currently, the 386SX provides NECIS with its biggest area of growth. Sales for NECIS' SX products have risen 400% in the last four months. "All indications from the channel are that this is not just an NEC phenome-

non," a spokesman said.

However, the 486 will be "the box of choice for the Fortune 1,000," Miller predicted. Delivery of a 486 micro is roughly slated for February, he said.

NECIS does not intend to follow IBM's lead by offering as either an upgrade or interim solution a 486 plug-in card for its 386-based line of Powermate PCs. IBM's approach will not provide the same performance as a PC built from the ground up to run on a 486, Miller claimed.

"IBM [essentially] is saying, 'Look, we did it.' I view that as a demonstration, and if you can't buy it today, I don't care," Miller said.

By the time IBM is able to ship those boards in volume, NECIS and others will have 486 boxes available, he added. Volume shipments of the I486 chip are slated for late this year.

There are no plans for an IBM Micro Channel Architecture-compatible, he added, unless customers demand it. "No one is

buying them," he said.

Of more immediate impact, NECIS earlier this month revved up the high end of its Powermate line of 286 and 386 PCs. Two introductions of interest included the following:

• **Powermate 286 Plus.** Features include a small footprint, 8 MHz or 12 MHz, zero-wait states, 1M byte of random-access memory expandable to 16M bytes, five expansion slots, serial and parallel ports, floppy drives from 360K bytes to 1.44M bytes (3½ in.), IBM Video Graphics Array (VGA) on the motherboard, three disk-storage half-height slots, keyboard and mouse ports moved to the front and 1M byte of 80-nsec dynamic RAM under the 12-MHz memory bus. Pricing ranges from \$1,999 to \$2,899.

• **Powermate 386 SX.** Features include 8 MHz or 16 MHz with less than one-wait state; 2M bytes to 16M bytes of RAM, of which 10M bytes can be 80-nsec RAM; super VGA graphics on the motherboard; five expansion slots, a parallel printer and serial port; and 1.44M- or 1.2M-byte floppies. Microsoft Corp. Windows/386 is provided as an introductory promotion. Pricing is from \$2,699 to \$3,599.

## Siggraph

FROM PAGE 33

1,280- by 1,024-pixel resolution in less than one second. It is slated to ship in the fourth quarter.

• Sony Corporation of America unveiled a 19-in. high-resolution dual-scan color monitor. The Model GDM-1930 features 1,024- by 78-pixel or 1,280- by 1,024-pixel resolution. It will be available in the fourth quarter, the firm said.

• Jupiter Systems' new Model 310 display is supplied with X Window System server software and supports X Window Version 11. Jupiter said it can ship 45 days from receipt of order.

• Four models of a monitor that can simultaneously display two pages of information were announced by Panasonic Communications and Systems Co. in Secaucus, N.J. The monitors' double-page display facilitates page layout and allows users to more easily view, move and edit two pages of the same document. The products' prices range from \$1,600 to \$2,099.

• Panasonic also brought out two 5¼-in. write-once, read-many optical disk drives that allow users to store and retrieve 940M

bytes of data from a single cartridge. The products are now available and sell for \$2,299 and \$3,299, depending on features.

• Atto Technology, Inc. in Amherst, N.Y., unveiled a solid-state disk for the Sun Microsystems, Inc. Sparcstations 3 and 4 series. With the Silcondisk Pro, a Sun workstation user can access data via the small computer systems interface at an access time of .05 msec. An 8M-byte model costs \$6,114, and a 24M-byte version costs \$11,994.

• Page-printer maker QMS, Inc. in Mobile, Ala., announced a new version of its QMS-PS 2200 printer. The Model E features Adobe Systems, Inc. Postscript printing capabilities and is now shipped with hardware-resident Hewlett-Packard Co. HP GL and HP PCL emulations. It is available now for \$15,995.

• Next, Inc. computer users will be able to project the machine's high-resolution display on less expensive medium-resolution monitors, thanks to Extron Electronics. The Santa Fe Springs, Calif., company's Extron video scan board makes this possible with a lower 33-KHz scan frequency. The board is slated to ship by the end of the third quarter, the firm said.

## NEW PRODUCTS

### Software applications packages

STSC, Inc. has announced Version 3.0 of the Atlas Graphics Mapping Package, a thematic mapping package for personal computer users.

The software was designed primarily for sales and marketing managers, financial analysts, market researchers, demographers and other professionals who analyze geographically based data. The latest release includes two additional map types — curves and points — to permit users to map elements such as rivers, highways and cities, the vendor said. Version 3.0 costs \$450, and upgrades from Version 2.15 are reportedly available for \$100.

**STSC**  
2115 E. Jefferson St.  
Rockville, Md. 20852  
301-984-5000

A software package designed to convert existing hard-copy drawings to computer-aided design (CAD) formats has been introduced by Foresight Resources Corp.

Called Drafix CAD Overlay, the package reportedly uses scanned images of existing drawings and displays those images on the user's screen. The user then traces the image using the product's drawing and editing tools, the company said. Draw-

ings are then stored in either bit-mapped or vector representation formats.

The package is used with Drafix CAD Ultra 3.00 software and is priced at \$195. A mouse or digitizing pad is required.

**Foresight Resources**  
10725 Ambassador Drive  
Kansas City, Mo. 64153  
816-891-1040

Logitech, Inc. has introduced desktop publishing software that produces high-quality output for the IBM Personal Computer, AT, Personal System/2 and compatibles.

Called Finesse, the mouse-based software uses a combination of pull-down menus, dialogue boxes and quick keys for document creation. Text can be created in Finesse or imported from various other applications, while images can be scanned into Finesse using Logitech's Scanman handheld scanner.

Containing numerous layout tools, the package is offered at an introductory price of \$179.

**Logitech**  
6505 Kaiser Drive  
Fremont, Calif. 94555  
415-792-8901

Dianachart, Inc. has introduced Instatrend, a real-time graphics-monitoring software package for IBM Personal Computers, IBM Personal System/2s, clones and laptop computers.

The package reportedly offers the user a choice of formats

for displaying real-time process data, including temperature, pressure and flow rate.

According to Dianachart, the spreadsheet-style menus permit the selection of strip-chart windows with one to 16 charts per screen in either process (time-vertical) or scientific (time-horizontal) format, bar graph, spreadsheet and process layout displays.

The price is \$325.  
**Dianachart**  
129 Hibernia Ave.  
Rockaway, N.J. 07866  
201-625-2299

### Macintosh products

GCC Technologies, Inc. has introduced a series of zero-footprint hard disks for the Apple Computer, Inc. Macintosh.

Ultra-drive reportedly comes with partitioning software and Symantec Corp.'s utilities with functions, including deleted-file recovery, crashed disk recovery, floppy disk duplication and hard-disk defragmentation.

The units range in capacity from 20M to 155M bytes and are available in internal or external models. The external drives are being designed with a zero footprint to fit directly under the computer.

The series is scheduled to begin shipping this month, and prices range from \$529 to \$1,799.

**GCC Technologies**  
580 Winter St.  
Waltham, Mass. 02154  
617-890-0880

## Macromind

FROM PAGE 37

transitions between scenes and sound effects.

In addition to the many sounds provided, you can enter text and have it automatically pronounced by Macintalk, or you can use Farallon Computing, Inc.'s Mac Recorder to add realistic digitized voice-overs and sound effects.

Director can also access events or sequences input from a device with a Musical Instrument Digital Interface, or MIDI, interface. You can record Director documents on videotape using a third-party interface at-

tached to the Mac.

Director's animation speed varies, depending on your CPU. The maximum you can expect on a Mac II is 60 frames per second. A Time menu lets you estimate video length and lock the timing so that it plays at the same speed on all Mac systems.

Director includes Overview and Studio manuals, both of which have many illustrations. On-line Help is context-sensitive, and on-line tutorials are followed by step-by-step tutorials in each manual.

Experienced paint artists will be able to use Director's paint tools immediately, and most Mac users will be able to create a useful but basic presentation within a few hours. Learning all of Director's features will easily take twice as long. The Studio features will be easier to master if you have animation experience. Also, it helps to work on a large screen.

Director does what you tell it to and always reminds you if you are about to do something that will seriously affect your data. However, it does have an undo feature.

Support includes 90 days of unlimited technical help. There is also fax support. Extended technical support can be purchased for \$100 and includes product announcements. The technical staff is knowledgeable.

Director offers a high-quality paint program and the capability to create animated desktop presentations in addition to its video features. If you add it up all, the \$695 price tag is reasonable.

E-Machines, Inc. has introduced a full-page color display system for the Apple Computer, Inc. Macintosh II family.

Colorpage 15 reportedly allows the user to view a full page of text on its flat screen as it will appear on the printed page at a resolution of 72 dot/in.

According to E-Machines, other features include 256 displayable colors from 16.7 million colors available in the video controller's programmable palette and a footprint measuring 14.9 by 12.6 by 15.5 in.

The complete Colorpage system, including a monitor and video controller, carries a price tag of \$2,095.

**E-Machines**  
9305 S.W. Gemini Drive  
Beaverton, Ore. 97005  
503-646-6699



# Meet the #1 Software for a Growing Family

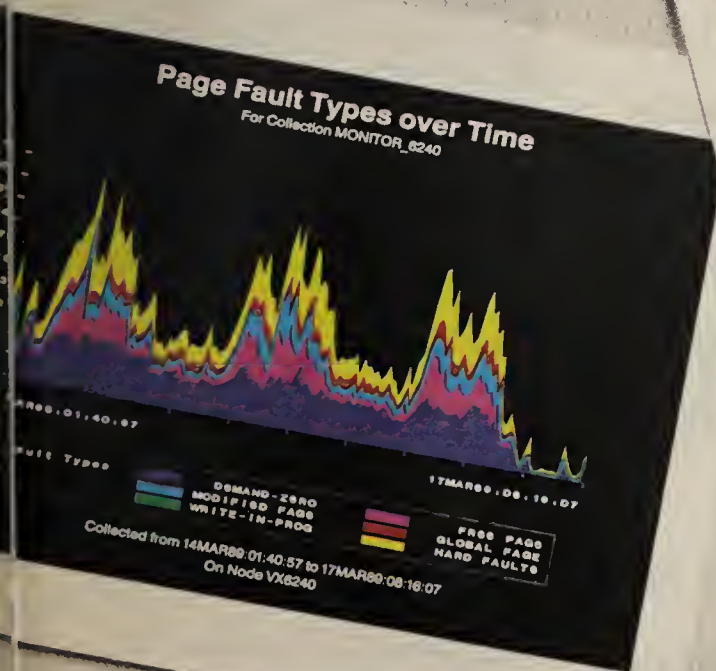
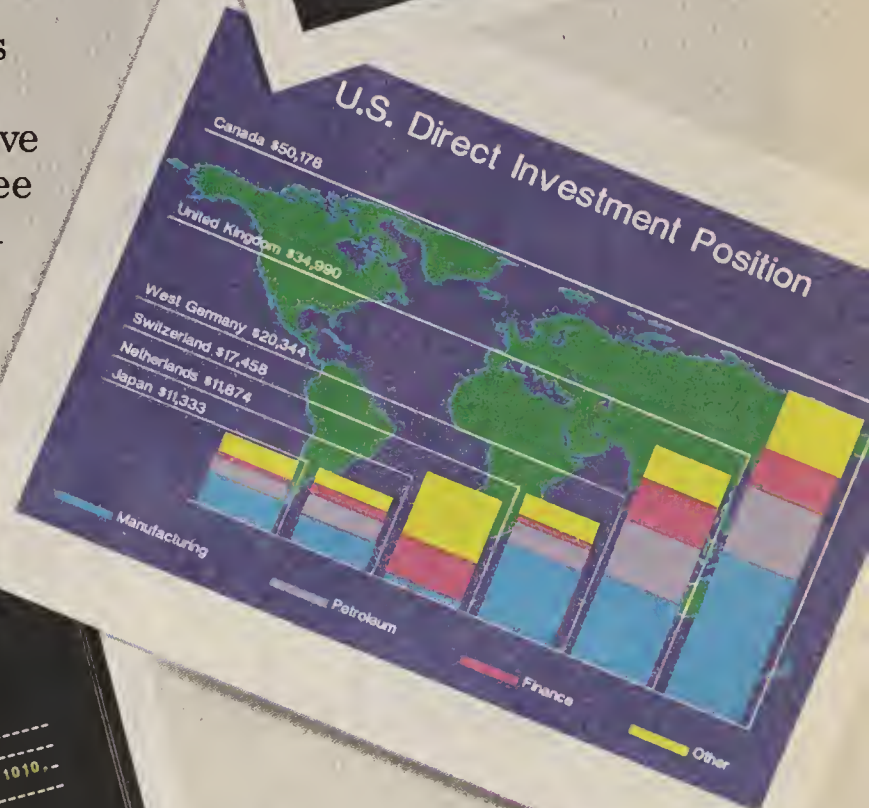
The more you rely on the expanding family of VAX™ computers, the more you need the SAS® System—the leading data analysis and graphics software in the VAX market. No other software has the power and flexibility to handle *all* your data management, analysis, and presentation needs. Across the entire range of VAX systems.

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And now we've extended the family with specialized tools for evaluating VAX computer performance, as well as interfaces to popular data bases such as ORACLE® and Rdb™. No wonder experts call the SAS System "...perhaps the most sophisticated and versatile family of products on the market."\*

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\*Digital Review. Reprint available.

The SAS System runs on the entire family of VAX minicomputers and workstations under VMS. Mainframes, personal computers, and UNIX-based workstations from other vendors are also supported.

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## Anyone can develop a Macintosh-to-IBM mainframe link. On the surface.

It's not particularly difficult to physically connect a Macintosh to an IBM mainframe. The hard part is coming up with a solution that takes the whole process to a much deeper level.

No one knows this better than Avatar.

The fact is, with over seven years of 3270 connectivity experience and a

dedication to Macintosh integration ever since there was a Macintosh, MacMain-Frame can offer you advantages nothing else can.

Like software that works exactly the same on every single Macintosh model, from the Mac512Ke to the MacIIcx.

Software designed to cut training costs now and

built with staying power for the future when your system needs become more complex. Both of which can really help you keep things under control.

And where others settle for mere physical connectivity, Avatar gives you performance much deeper than that.

Like true Mac-like

DFT support that lets you run as many as five mainframe sessions at once, and that *PC Week* said, "stands in a class by itself."

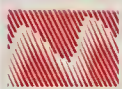
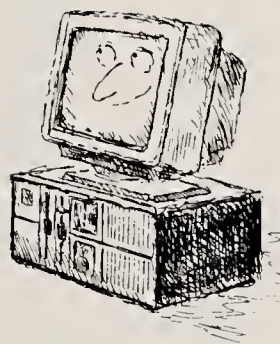
Like the ability to customize applications so users work with mainframe information precisely the way *you* want them to. There's even a special programmer's toolkit that comes with Avatar's API, Hypercard API, and MacWorkstation TLPM module. And naturally, we support all Apple standards and conventions.

Even more importantly, you can expect the responsive service, support and applications expertise that it takes to make a connectivity solution really work.

We have a free brochure on Mac-to-mainframe connectivity that will answer many of your questions. To receive yours, call us at 1-800-289-2526. Or write: Avatar Corporation, 65 South Street, Hopkinton, Massachusetts 01748.

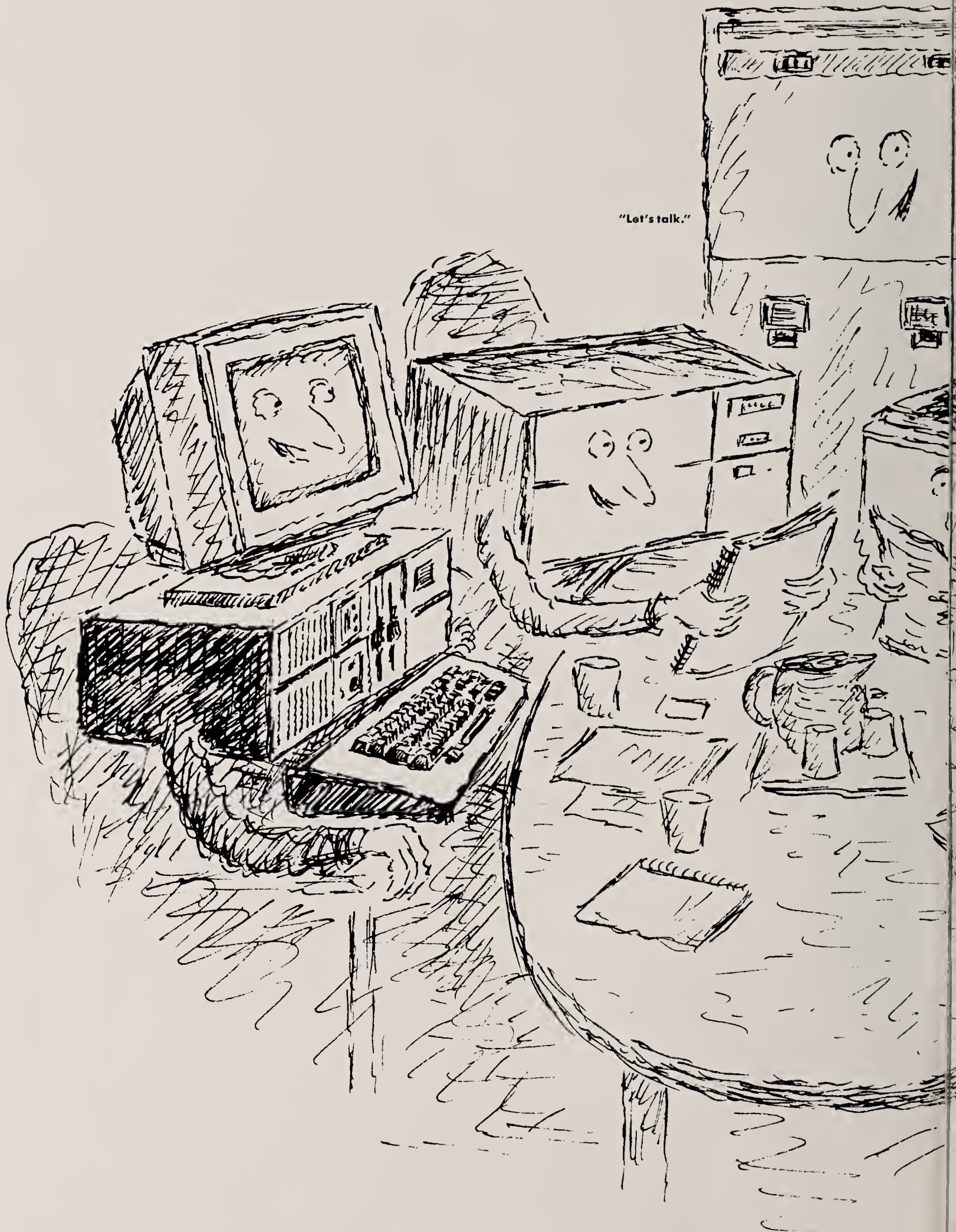


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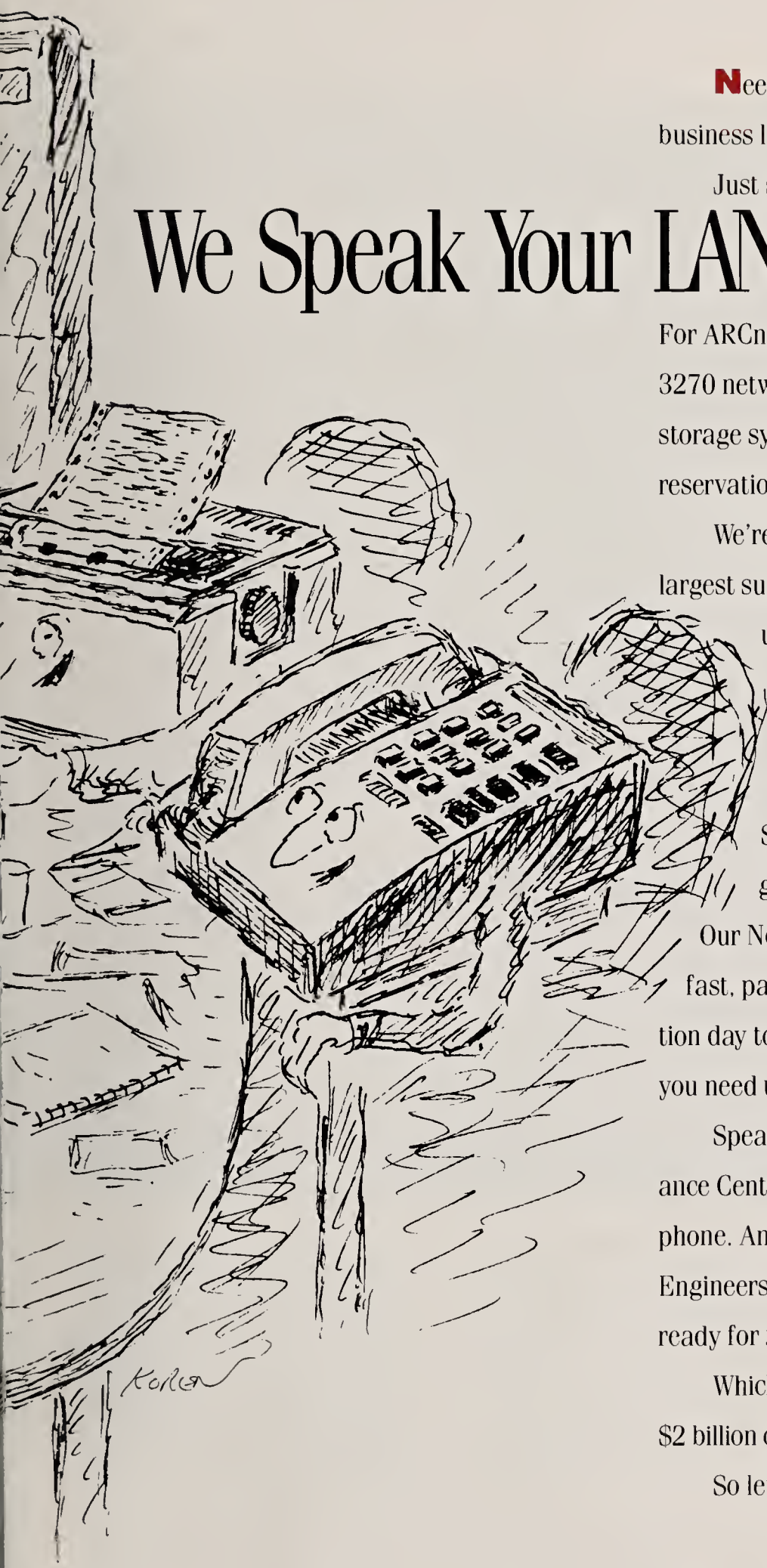
MEMOREX TELEX





"Let's talk."





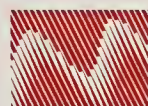
**N**eed systems integrators fluent in your business language?

# We Speak Your LANguage.™

Just speak up. We'll listen to you, we'll understand you and we'll deliver solutions. For ARCnet, Ethernet and Token Ring LANs, for 3270 networks, for midrange systems, for large storage systems and even the most exotic airline reservation systems.

We're the people of Memorex Telex, the world's largest supplier of plug-compatible computer products, accessories, service and support.

For starters, we engineer, manufacture or source virtually any product you could need.



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Our Novell®-certified instructors train users for fast, painless startup. We're there from installation day to maintenance day and every other day you need us.

Speaking of needing us, our Technical Assistance Center offers you remote data acquisition by phone. And if they can't fix it, our 1300 Customer Engineers are based at 260 strategic U.S. sites, ready for 24-hour/7-day dispatch to your door.

Which wraps up a full-service package only a \$2 billion company can talk about... *in your language.*

So let's talk.



7070 NETWORK SERVER

7045 INTELLIGENT  
WORKSTATION

7040 INTELLIGENT  
WORKSTATION

# Intelligent Systems Series



The **7045 Intelligent Workstation** gives you full desktop capacity in a smaller package. We integrated video support and diskette control in the base system to give you six expansion slots for a full range of communications or other options. Standard 1MB of RAM and 80286 operation at 8/12MHz or 8/16MHz. The companion **7065** offers 16MHz or 20MHz 80386 microprocessing, making either unit a high-performance solution for a LAN, as a LAN server, or standalone.

Powerful performance perfect for the most demanding LAN server and high-end multi-user applications. The 20MHz **7070 Network Server** delivers up to 16MB of RAM with five available storage bays for total flexibility. Effortlessly supports leading network operating systems and can platform complex CAD/CAM/CAE programs.

A low-profile but highly-integrated 80286-based workstation. The **7040's** built-in functionality leads competitors with integrated video and floppy disk support, SCSI fixed-drive interface and a mouse port. Switchable 8/12MHz and three expansion slots make this compact performer readily expandable and adaptable for a variety of applications.



**7025 INTELLIGENT  
WORKSTATION**

# Token Ring LANs Ethernet Arcnet



The industry standard for packing big 12MHz performance in a small footprint. An excellent solution for both LAN or standalone applications, the **7025 Intelligent Workstation** also features integrated disk and video controllers, providing two expansion slots for add-in adapter boards.

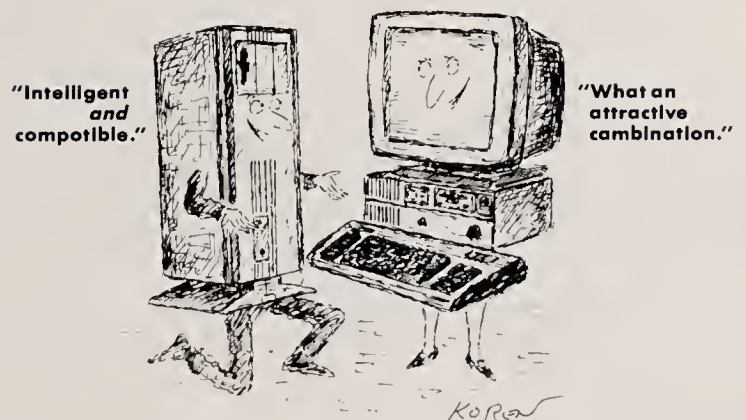
The Memorex Telex Intelligent Systems Series gives you a single source for a complete line of state-of-the-art workstations.

For LANs, WANs, or as stand-alones. With full connectivity for 3270 and midrange systems. For airlines systems and travel applications, Memorex Telex integrates ALC solutions and customizes them to meet end-user requirements.

We've selected our most reliable plug compatibles. Then increased performance, streamlined profiles and integrated functions, and expanded flexibility to offer you unmatched versatility in systems solutions.



Then you get added value on top of this added value. With expert consultation, design, installation, user training and customized support. All of which makes Memorex Telex the hardware systems integrator you need to speak your LANGUAGE.





**5460 TAPE  
CARTRIDGE SUBSYSTEM**

**3261/81T TAPE SUBSYSTEM**

**1197-D/W2  
DISPLAY STATION**

**1224 PRINTER SERIES**

**1197-C2 COLOR  
DISPLAY STATION**



An ergonomic and highly functional display available with green, amber or black-on-white 15" monitor, the **1197-D/W2 Display Station** is capable of 3,650-character display and split-screen mode. Supports up to three concurrent sessions (two displays and one printer) and 83-, 102- or 122-key keyboards. Features print trim, host-addressable printing and support of twisted pair or twinaxial cabling.

The **1224** series of intelligent 4224-compatible desktop matrix printers utilizes the advanced functions of IPDS support such as graphs and barcodes. 256K or 512K memory. Handles 250 or 400 cps in one, four or eight colors and offers versatile paper-handling capabilities.

Offering brilliant, two- or seven-color display modes, the **1197-C2 Color Display Station** supports up to three concurrent sessions (two display and one printer) and four terminal modes. Use with 83-, 102- or 122-key keyboards. More features include print trim, host-addressable printing, and support of twisted pair or twinaxial cabling.



1196 A/B  
DISPLAY STATION

# S/3X and AS/400™ ENVIRONMENT

line  
of plug-

If you're unaware of Memorex Telex's total commitment to midrange users, consider this fact:

We offer you the world's most comprehensive compatible products for S/3X and AS/400 environments. Period.

That means everything you want, from nobody else.

Personal systems and workstations. Display stations. Impact and non-impact printers. Systems printers. Disk and tape storage devices. Add-in memory and other system upgrades.



Many we R&D ourselves. Others we OEM-source and enhance. All of them we continually evaluate and upgrade to give you uncompromised quality, reliability and performance. Today, tomorrow, and well into the next century.

Which, for midrange users, is good news in any language.

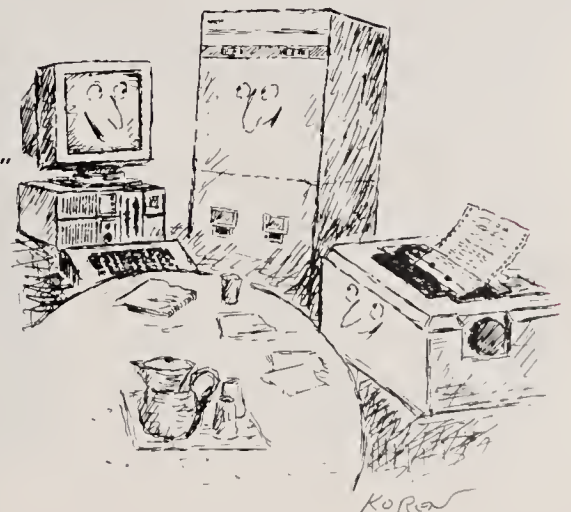


Introducing state-of-the-art storage that's 100% compatible with the 3480 standard. Configured with an automatic cartridge loader, the **5460 Subsystem** can back up more than two gigabytes of data without operator intervention.

The **3261/81T Subsystem** is the midrange industry standard for save/restore operations. Fully compatible with 3422 and 3430 tape systems, it offers densities of 1600/6250 bpi with data transfer rates from 200kb to 1250kb per second.

The **1196 A/B** full-function 12" Monochrome Display Station features a choice of 83-, 102- or 122-key keyboards as well as host-addressable print support. Supports twisted pair or twinaxial cabling.

"We're all  
in this together."





## 3890 DISK DRIVE SUBSYSTEM

## 6890 SOLID STATE SUBSYSTEM



*The 3890 Disk Drive Subsystem, our latest generation of disk drives, is an innovative approach to triple capacity. We reduced head disk assembly size to eight inches (from 14") to improve reliability and serviceability. And to offer the industry's best price and capacity per square foot.*





**5480/SP2 CARTRIDGE  
TAPE SUBSYSTEM**

# Large Storage SYSTEMS



1Mbit semiconductor storage technology makes the **6890 Solid State Subsystem** high-performance system perfect for critical, frequently-accessed data. Solid state means no moving parts and no seek time. Its thousands of operations per second boost user productivity. Holds both temporary system files and permanent production data.

**W**ho packs more facts in a square foot than anybody? Memorex Telex.

We pioneered our first disk drive storage unit a generation ago. And each succeeding generation of Memorex Telex devices — from tape to solid state to cartridge robotics — has meant more cost-effective storage, processed faster, easier to expand, and simpler to operate.

All with floorspace savings that crowd neither computer rooms nor budgets.

But hardware is just the beginning. Our Customer Engineers and support teams are peripheral, channel and mainframe-trained. From the first analysis to the last test run, you'll get the seasoned systems service you need in your nonstop, real-time environment.



*We're building on the success and reliability of the **5480 Cartridge Tape Subsystem** with a simple, space-saving idea: stack them! This **5480 Special Package** offers the highest capacity-per-square-foot in the industry, and sets new standards for ease of operation and maintainability. New robotic options vastly increase data handling flexibility and speed.*

"Any questions?"





## 1174 NETWORK CONTROLLER

## 1324 COAX MATRIX PRINTER

## 1192 ENHANCED FUNCTION DISPLAY



The highly-reliable choice for high volume printing, the **1324 Coax Matrix Printer** is rugged, supports IPDS and is user-friendly. Forms modules make swap-outs fast and keep paper alignment perfect. Handles four- and eight-color printing. Best of all, its LCD message center speaks in English, not cryptic codes.

A versatile networking platform in 3270 environments, the **1174 Network Controller** offers user benefits that go far beyond current standards. Supports up to 96 devices and up to four 3270 hosts at once. So you'll get cost savings and greater flexibility in network processing, with 3270 and asynchronous communication combined with Token Ring-based networks. A totally new set of standards for connectivity and networking reliability.

With an array of screen sizes, specialized keyboards and a new modular design, the **1192 Enhanced Display** series launches an era of enhanced operator productivity. These displays offer features you can't find on other 3270 products — programmable-base colors, field marking for clear identification of data entry fields, screen sizes up to 132 columns, on-screen calculator functions and local screen print capability for easy desktide copy.



**C19A COMBINED  
FUNCTION TERMINAL**

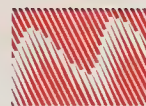
# 3270 NETWORKS

controllers. And no one can touch us.

It's a simple and successful formula: We listen to our customers, anticipate their needs, and deliver solutions. Year after year.

The result is an extensive family of products for the 3270 application environment that creates an industry standard. A complete range of displays, from basic to multi-function. Controllers for simple or advanced networking applications.

New laser printers that attach to 3270 controllers, PCs and LANs simultaneously.



All 100% plug compatible. And all 100% conversant in your business language.



*The C19A Combined Function Terminal provides desktop automation tools that dramatically enhance operator productivity. This 3270 plug-compatible terminal provides multiple data communications, extensive windowing capabilities, inboard applications and integrated telephone features. That means operators conduct more calls, quickly and accurately update system information and automate repetitive tasks. Nobody combines functions better.*

**"Compatible?  
I never met a  
Memorex Telex  
terminal I didn't like."**

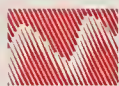




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*Let us prove our fluency in the LAnguage of your business by returning the card below.*

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Of  
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| <input type="checkbox"/> <i>S3/X and AS/400™ Environment Products</i> | <input type="checkbox"/> <i>Controllers</i>  |
| <input type="checkbox"/> <i>Large Storage Systems</i>                 | <input type="checkbox"/> <i>Printers</i>     |
| <input type="checkbox"/> <i>3270 Network Products</i>                 | <input type="checkbox"/> <i>Other</i> _____  |

**NAME** \_\_\_\_\_

**TITLE** \_\_\_\_\_

**COMPANY** \_\_\_\_\_

**ADDRESS** \_\_\_\_\_

**CITY** \_\_\_\_\_ **STATE** \_\_\_\_\_ **ZIP** \_\_\_\_\_

*4343 S. 118th East Avenue  
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1-800-950-3465*

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## DATA STREAM

Jeffrey N. Fritz

### ISDN: Buyer beware



It's finally coming to your office. The director of networking announces that in the third quarter, your company will receive its first ISDN lines, and you are on the committee to select the necessary equipment. The task seems formidable. How can a new ISDN user comprehend all the choices among desk sets and terminal adapters?

In one sense, the task is simpler than you may think. A limited number of manufacturers are offering Integrated Services Digital Network equipment, so your choices are generally few. On the other hand, information to assist you in making your choices is also sparse.

To prepare for your meeting with a vendor, draw up a list of questions about its ISDN prod-

*Continued on page 49*

#### Inside

- Vitalink unveils the Transpath product line. Page 48.
- Novell takes a bite out of Da Vinci Systems. Page 52.
- New Mexico backup network features VSAT technology. Page 57.

## AT&T price cuts drop below 'cap' floor

### ANALYSIS

BY MITCH BETTS  
CW STAFF

WASHINGTON, D.C. — Now that the federal "price caps" regulatory regime for AT&T is in place, it turns out that the big battle is not whether AT&T's latest tariff exceeds the cap but whether it should fall below the official price floor.

On the face of it, that kind of

deep price cutting is good news for AT&T's digital private-line customers. AT&T filed a tariff last month slashing the prices of its Accunet services that reduces the charges for an average 300-mile T1 circuit by 21%.

The tariff implementing AT&T's "Digital All-Stars" program is scheduled to take effect Aug. 24 unless the Federal Communications Commission suspends or rejects it, as AT&T's chief rivals have urged. The pro-

gram allows users to save up to 35% on T1 lines and up to 45% on T3 lines, makes the charges mileage-sensitive and sweetens the volume discounts.

AT&T said the price cut was needed to keep its private-line services viable in the face of intense competition from MCI Communications Corp. and U.S. Sprint Communications Co. [CW, July 24].

Indeed, AT&T noted that since January, both MCI and

U.S. Sprint have reduced their rates for an average 300-mile T1 circuit by 26%.

However, AT&T's action also means that the price index for its family of digital private-line services falls well below the price floor set by the FCC's new regulatory system.

Under the price caps regulation that went into effect July 1, AT&T may raise or lower prices by 5% in a single service category.

*Continued on page 53*

## Oppenheimer study: Trends are shifting

BY PATRICIA KEEFE  
CW STAFF

NEW YORK — The drive toward enterprisewide networks has triggered a discernable shift in corporate attitudes toward purchasing, planning and strategic uses of local-area networks, according to a survey of 150 users for Oppenheimer & Co.'s annual networking survey.

Survey respondents forecast continued strong LAN growth over the next two years, with a significant number expanding their current networks and a comparable portion of non-LAN users planning to link up. However, this next stage of LAN growth will be markedly different, according to the Wall Street firm's report.

As LANs become an integral part of major corporations, is-

lands of work-group LANs are expected to constitute an ever smaller proportion of future installations. Instead, desktop-based LANs will gradually become responsible for many host-based — minicomputer or mainframe — applications.

Many LANs have already taken the first step down that road. Among LAN users, 57% were connected to a mainframe or mini; another 14% expect to implement such connections by year's end.

Compared with last year, users today attach a greater importance to sharing peripherals and data between a LAN and a host, noted Cecilia Brancato, author of the report and an Oppenheimer analyst.

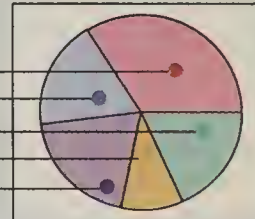
Internetworking, whether remote or local, will prove critical to users both in the short and

### Control issues

IS is moving to take charge of LANs, according to a survey of 150 users

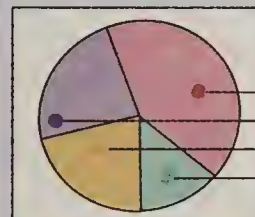
#### Who approves LAN installations?

- Corporate manager - 34%
- Division manager - 18%
- Committee - 18%
- Work group individual - 10%
- All of the above - 20%



#### Has company standardized on a LAN?

- 42% - Yes
- 23% - No, but looking into it
- 22% - No, decision made by department
- 13% - No plans to install a LAN



SOURCE: OPPENHEIMER & CO.

CW CHART: DOREEN DAHLE

long term, she said. "A recession will likely accelerate the move to distributed processing due to economic forces," she added.

Despite the need for interconnectivity, the higher level protocols — Transmission Control Protocol/Internet Protocol, Xerox Network Services and Advanced Program-to-Program Communications/PC — that are

supported by a LAN product have little impact in determining which product the survey users select.

The drive to link LANs to each other and to host databases has piqued corporate information systems interest in LANs as never before. The LAN life cycle parallels that of personal computers.

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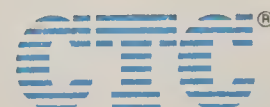
```
EDIT1 D SCOROLSOURCE.DHFCALL.COB
COMMAND -> F P CICS a b
000062 FIN
000063 GO TO CICS-CONTROL.
000064 READ-INPUT
000065 EXEC CICS HANDLE CONDITION MAPFAIL(MOTMOD) NOTFND(MOTFOUND)
000066 ERROR(ERARS) DUPREC(DUPREC) END-EXEC
000067 EXEC CICS RECEIVE MAP('XDFHCB') END-EXEC.
000068 IF EIDTAMID = 'UPDT' THEN
000069 EXEC CICS READ UPDATE DATASET('FILE') INTO(FILE)
000070 RIDFLD(MUM IN COMMAREA) END-EXEC
000071 IF FILEREC IN FILE NOT = FILEREC IN COMMAREA THEN
000072 MOVE 'FILE ALREADY UPDATED - REENTER' TO MSG10

EDIT2 D SCOROLSOURCE.COB
COMMAND ->
000062 NAME EXT SIZE DATE TIME
000063 ADDENTRY COB 7680 01/12/87 12:42p
000064 ADDMENU COB 2560 03/26/86 8:02a
000065 ASKDANGR COB 1536 03/23/86 10:33a
000066 ASKTOP COB 1536 11/25/85 11:07p
000067 CHGSEL COB 6144 01/12/87 12:48p
000068 CKDATE COB 1024 01/07/86 8:11p
000069 DUPACK COB 2048 10/30/85 9:47p
000070
000071 174 K APRIL - 2 4
```

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# Vitalink adds TCP/IP router to Transpath bridge

BY PATRICIA KEEFE  
CW STAFF

FREMONT, Calif. — Vitalink Communication Corp. recently introduced the Transpath product line, a family of interconnection products for local-area networks that incorporates a Transmission Control Protocol/Internet Protocol (TCP/IP) router and the capabilities of Vitalink bridges.

Vitalink users are now reportedly capable of linking a virtually unlimited number of remote sites over common carrier transmission lines into a single integrated computer network. "Transpath operates with the tens of thousands of Vitalink and Digital Equipment Corp. bridges already in use today," claimed Randy Fardal, director of marketing.

Many of its customers have large networks, some with more than 100 sites and 30,000 users, Vitalink said.

The routers are said to provide two new networking capabilities: dynamic bridging and routing on a single port as well as best-path routing in a network of both bridges and routers. Transpath features split-path routing and Routing Information Protocol (RIP), which provides flexible access to foreign routers.

Available now, Transpath pricing begins at \$14,000. All the features of Vitalink's Translan and Transring bridges are incorporated into the Transpath product family, which includes the Transpath 550 and 530, high-performance bridge/routers for interconnecting Token-Ring networks and the Transpath 350, which interconnects Ethernet LANs.

## Making sure

Interoperability between the two environments is ensured by translating the link layer protocols to enable Ethernet devices to communicate on a peer level with Token-Ring devices using TCP/IP.

Routing applications have been used traditionally for the interconnection of university and government networks, in which the primary communications protocol is TCP/IP. A growth market for router applications, however, is the commercial market, which is rife with multi-vendor networks using a cornucopia of protocols. Protocol-transparent bridges are favored in this market for wide-area interconnection, according to Vitalink.

However, commercial networks are also increasingly turning to TCP/IP. Traffic loads and overall network size are expanding to a point where some networks now contain more than 100 bridges. The problem here is that bridge and router net-

works individually have practical size limitations. However, Vitalink claimed that users can surmount that barrier by using Transpath routers to partition the large bridge domains.

Transpath also prevents network overload by isolating broadcasts from incompatible

TCP/IP implementation to the local network segment. Extensive network management and diagnostic capabilities are also provided, including Simple Network Management Protocol and Telnet.

Vitalink, which is estimated to hold 70% of the wide-area

bridge market, has totally reversed its financial picture from the mid-1980s, when it had gone through \$37 million in cash. At that time, Vitalink was unsuccessfully targeting the satellite transmission market.

In January 1986, a new management team came on board

armed with a \$1.2 million loan and developed a wide-area bridge line. Vitalink is now moving to broaden that base. "The routing and bridging markets are blurring to the point where Vitalink should be able to leverage their presence in the bridge market to do well in the router market," said Richard Kimball, an analyst at Montgomery Securities in San Francisco.

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# Fritz

FROM PAGE 47

ucts. Find out how its equipment fits into your computing environment. This applies to any equipment buying, but there are specific questions to ask when dealing with ISDN.

One important issue is whether the equipment will

work in your networking environment. For example, is the device certified to work with the particular central office switch that your local carrier uses?

ISDN supports synchronous and asynchronous communications. However, what the terminal adapter provides may be more dependent on the manufacturer's preference than on any ISDN capability. Unless

you are fond of protocol converters, it makes little sense to have asynchronous terminal adapters in an all-IBM shop.

Be wary of old wives' tales. You may be told that there is little use for multiple data ports on an ISDN device. Never mind that multitasking environments such as OS/2 can make very productive use of multiple ports. The pundits of this theory

seem to ignore what is a common scenario in data-intensive environments — co-located computers. If the customer-premises equipment (CPE) has two ports, your outlay for ISDN lines and CPE is cut in half.

Pay attention to the maximum synchronous and asynchronous data rates supported by the terminal adapter or desk set. For example, you may even be

told that "no one needs data rates any faster than 19.2K bit/sec." Unless your transfer needs are light and will be for some time to come, you are well advised to avoid this counsel. After all, ISDN provides three separate channels, two supporting rates of up to 64K bit/sec.

It has been said that ISDN is really an evolving set of standards. There is much truth to this statement. ISDN standards will continue to grow in the next few years. In a sense, this is akin to the growth that personal computers have undergone in the last eight years. Yesterday's wonder is today's ho-hum and tomorrow's collector's item. Therefore, when considering purchase of ISDN CPE, take a look at the upgrade paths.

In some cases, the manufacturer's upgrade path is simple but expensive: "Just throw the device away and buy the new version." A better approach is found in user-installed upgrades contained on an erasable programmable read-only memory chip.

As quickly as a child can change games on a Nintendo game, a user can add the latest bells and whistles to an ISDN device. Give serious consideration to any manufacturer offering reasonably priced field-replaceable upgrades.

Just as CPE can be upgraded, the central office switch also receives periodic upgrades called generics. When the central office upgrades the generic, it may impact the CPE side.

## Overeager vendors

Some vendors are so eager to get into ISDN that they talk as if their equipment is ready to go when the actual product may be months or even years away. A vendor recently responded to West Virginia University's request for proposal (RFP) for a campuswide ISDN integrated telephone system. This vendor, which does not have much exposure to ISDN CPE, was asked if it really could supply a complete ISDN system. The immediate reply was, "ISDN is no problem." A few weeks later, the vendor submitted a "no bid" response to the RFP. Obviously, the project was much more complex than the vendor had originally thought.

This leads us to the most important precept of all, "Missouri's rule." Say, "Show me," and insist that the vendor prove the capabilities of the proposed product. Then, conduct your own evaluation. Once decisions are made and upgrade paths established, you are ready for a new level of corporate data communications through the increased functionality of ISDN.

Fritz is a data communications analyst at West Virginia University in Morgantown.

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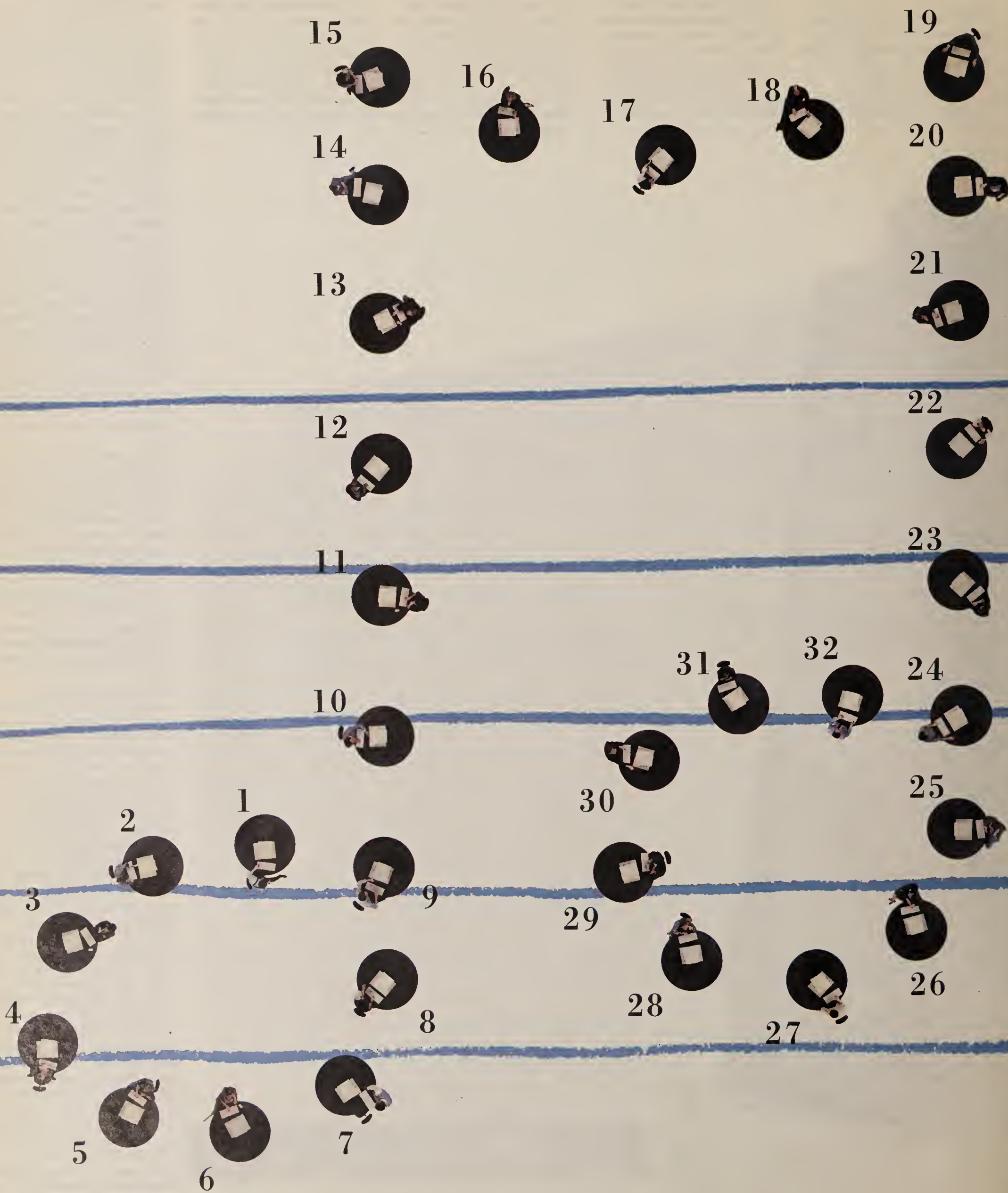
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# Novell to recolor Da Vinci palette

*Minority position in firm enhances Novell's plan to buy its way into enterprise networks*

BY PATRICIA KEEFE  
CW STAFF

RALEIGH, N.C. — The ravenous beast that is Novell, Inc. last week continued its insatiable quest for technology alliances, this time biting a "substantial" chunk out of Da Vinci Systems, a privately held developer of electronic mail and an early Microsoft Corp. Windows developer.

Provo, Utah-based Novell, which has opted for the acquisition and investment approach to expanding its local-area network-based products into an enterprisewide network contender, has taken a minority position in Da Vinci. Sources close to Da Vinci, which also offers object-oriented programming expertise, said that in return, it will develop at least the following two products for Novell's Netware network operating system:

- A Windows-based upgrade to current network management facilities that will simplify and pull together 30 separate functions under one graphically oriented interface.

**H**OW DID WE pull this off while going to school? By not being valedictorians."

CHRIS EVANS  
DA VINCI

- E-mail for the forthcoming Netware 386, based on Action Technology, Inc.'s Message Handling System (MHS).

The revamped management software will take advantage of a Windows application's ability to do several things at once. Hooks will be provided to allow third parties to incorporate administration of their hardware or software, a source said. For example, a network manager would be able to activate network backup from a third party with the same menu used to administer Netware.

Also, since object-oriented programming provides a high level of portability, it will ease efforts to move Da Vinci to other desktop operating systems such as Unix and Apple Computer, Inc.'s operating system. This will speed efforts to extend Da Vinci's compatibility to versions of Netware for Digital Equipment Corp.'s VMS and Apple's Macintosh.

The alliance also provides Novell with another avenue for Microsoft LAN Manager expertise as well as a link into 3Com Corp.'s 3+ Mail. Da Vinci's Email is not only compatible with LAN Manager, but the developer also wrote a program that allows its electronic mail package to exchange messages with 3+ Mail.

Da Vinci has already adapted some of Netware's application programming interfaces (API), allowing Email to automatically create the same user accounts and implement the same security measures set up on the Netware server. The same support is slated "sometime next year" for LAN Manager.

Further cementing Novell's commitment to its new partner, Da Vinci Email — which also supports MHS — will join Action Technology's Courier E-mail as

one of Novell's E-mail standards. Novell has a corporatewide license for Email but holds no marketing rights.

The investment was accomplished through an undisclosed cash combination of stock purchases and loans. Novell has options to purchase more stock but is prohibited from attaining a majority position.

Most recently, Novell completed its acquisition of Excelan, Inc., a supplier of Ethernet, Transmission Control Protocol/Internet Protocol and Sun Microsystems, Inc.'s Network File System, on

June 20. Novell has also purchased Santa Clara Systems, Inc. — which it later sold — CXI, Inc., Indisy and Softcraft.

Da Vinci was launched in 1984 by four college freshmen with about \$400. It has grown from developing the first E-mail package for Windows into a \$2 million to \$5 million company, said 23-year-old Chris Evans, vice-president of marketing.

"How did we pull this off while going to school? By not being valedictorians," he quipped.

Until Novell made its investment, Da

Vinci's capitalization had been based solely on reinvestment of its profits. The infusion of funds will help beef up the current staff of 20, purchase needed equipment and expand Da Vinci's push into the commercial market.

Da Vinci also markets Email for DOS, a character-based version of the Windows-based software, and will introduce a package for Hewlett-Packard Co.'s New Wave environment in October, Evans said.

"Anything we do can be PM-ized," he added, referring to support for Microsoft's Presentation Manager. "The documentation is a longer trick than the programming. I would look for something to show up next year." Also down the road is support for the proposed X.400 API, called the Retix specification.

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# Junk fax tug-of-war reflected in new releases

BY ELISABETH HORWITT  
CW STAFF

While value-added network vendors such as Telenet Communications Corp. are making it easier for companies to bombard target markets with facsimile transmissions, Pitney Bowes Facsimile Systems recently introduced an option designed to "lock out" unwanted faxes.

Telenet recently announced rate cuts of up to 70% for its international fax network, which is said to support fax-to-fax and IBM Personal Computer-to-fax communications between the U.S. and locations in Europe, Asia and the Pacific.

Telenet Fax service reportedly allows subscribers to send messages directly from a terminal or personal computer, without the need for a special fax board. The service is also said to provide multiple automatic redials if the receiving machine is busy.

Meanwhile, Pitney Bowes has announced an enhancement to its 8050 fax machines, which it claims will make it harder for junk-mail companies to use the automatic redial feature to flood users with unwanted messages.

The software will allow a fax to get through only if the sender's telephone number is on a list of up to 99 user-designated

telephone numbers, stored in the machine's memory. A manual receive button is said to enable the user to override the lock-out feature to allow receipt from telephone numbers not programmed into memory.

## One baby step for fax

The lock-out feature is a "baby step" toward solving the serious problem of fax junk mail, which threatens to slow the growth of both fax and electronic mail industries, according to Walter Ulrich, a senior analyst at Cambridge, Mass., consulting company Arthur D. Little. Users need a quick way to sort important busi-

ness documents from junk, particularly because legitimate faxes are often time-sensitive.

Users should be able to audit all incoming faxes, Ulrich said, even those whose senders' numbers are not on the "wanted" list. An important fax can originate from an unauthorized number; for example, from a manager on the road, "because one of the nice things about faxes is that they can be received from anywhere," he added.

Pitney Bowes' 8050 does provide a journal that generates a list of incoming calls — including those that do not get through, a spokesman said. The upgrade is priced at \$150 as an option for a new 8050 and at \$250 as a field upgrade to an existing machine.

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## AT&T

CONTINUED FROM PAGE 47

ry with minimal regulation [CW, March 20], but the new private-line rate reductions fall below that 5% floor.

The FCC rules allow AT&T to reduce prices below the floor only if it provides additional information demonstrating that it is not engaged in below-cost, or predatory, pricing. In addition, AT&T must give the FCC 45 days to review the prices before they take effect — compared with only 14 days' notice for price cuts within the 5% price band.

AT&T's filing said that revenue for the T1 and T3 services would exceed costs by nearly \$16 million in 1990, and thus the tariff does not constitute below-cost pricing.

AT&T's major competitors — namely, MCI, U.S. Sprint and the National Telecommunications Network — have filed petitions objecting to the rate reductions on grounds that AT&T's filing does not provide enough cost data to determine whether it amounts to unfair pricing. So long as AT&T remains classified as a dominant carrier, it must not engage in predatory pricing that could drive its competitors out of business.

MCI said that this tariff, the first instance of below-band pricing since the price caps regime began, is a test case that will determine whether the FCC plans to regulate AT&T as a dominant carrier or whether the price caps regulation is "a vehicle to assist the agency in further deregulating AT&T."

## Floors added reluctantly

All parties are aware that the FCC added floors to its price caps plan very reluctantly in response to pressure from members of Congress, who shared MCI's concerns about predatory pricing. Outgoing FCC Chairman Dennis R. Patrick said that, philosophically, he was opposed to price floors because price reductions are almost always good news for consumers.

Similarly, the FCC's official price caps order said that the floor was added in "an abundance of caution" and that below-band rate decreases "are more likely to be competitive than predatory." The FCC order said that price-cutting tariffs would be suspended only if the prices are "so low they can be presumed to be anti-competitive."

At the Communications Networks '89 conference early this year, an FCC staffer candidly acknowledged that price caps may be a "waystation" on the road to eventual deregulation of AT&T.



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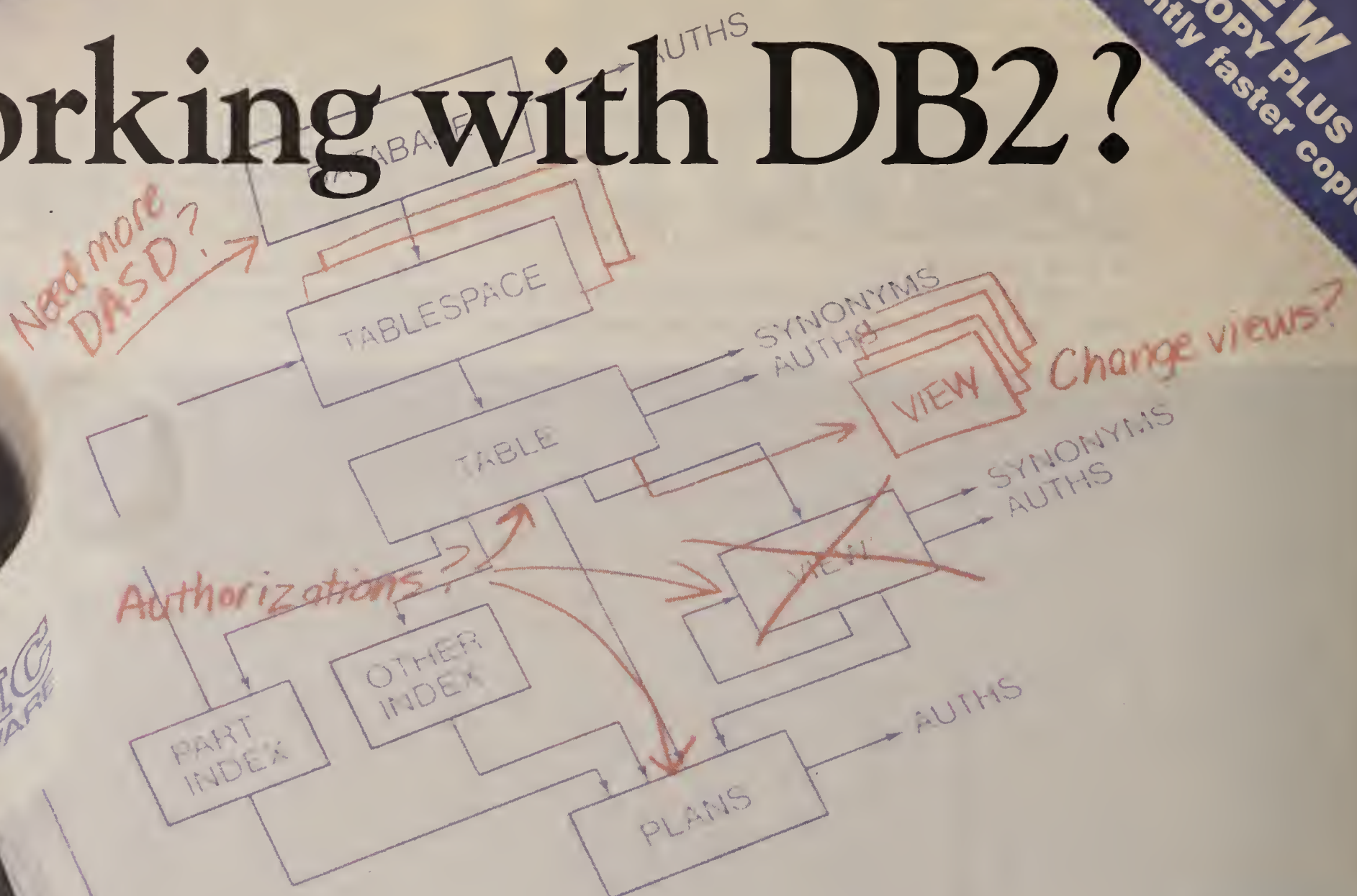
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CW



# Isicad tool untangles 'wiring spaghetti'

BY ELISABETH HORWITT  
CW STAFF

ANAHEIM, Calif. — A system introduced recently by Isicad, Inc. is said to mesh graphics database management with a relational database management system, eliminating much of the cost and grunt work of network facilities management.

Communications Management and Design (Command) provides two-way interaction between a relational database, which contains information on wiring and equipment inventory, trouble tickets, bills of materials and similar items, and a graphics database that can contain schematics of floor plans, cable layouts, equipment installations and patch panels.

Command provides users with an effective way to track "wiring spaghetti" in a building, as well as rapidly changing media and terminal technologies and protocols used in users' installations, Isicad spokesman Jerry Stephens said. It enables network managers to pinpoint problems by "walking through" a schematic of all the wiring and communications devices between a terminal and a host, he added.

The software generates trouble tickets, work reports and bills of materials from information stored in the database and provides consistent information to IS, telecom-

munications and financial departments, Stephens said.

One of the most important roles for Command is eliminating much of the cost associated with tracking moves, adds and changes by automatically updating relevant files and diagrams once the essential data is entered.

Instead of trying to keep track of users, workstations and equipment manually, "users can query the system, 'where is [a given user]?' and it will bring up diagrams of the room, furniture, computer and available sockets," Stephens said. Users can run "what-if" scenarios about the effect on users of specific reconfigurations "instead of cutting the cable and seeing who yells," he added.

Changes made to graphic representations of communications systems in the building will automatically update relevant information on the RDBMS and vice versa, Stephens said. Command uses Unisource Software Corp.'s Unify DBMS, which can hook into existing corporate databases for relevant financial or accounting data, he added. The system can also share data and schematics with Isicad's Prisma facilities management system.

Available in October, Isicad will cost \$50,000 for the initial workstation, including a graphics terminal and graphics and data applications.

# New Mexico taps VSAT access

Disaster-recovery net for human services agency tries new approach

BY ELLIS BOOKER  
CW STAFF

ALBUQUERQUE, N.M. — A geosynchronous satellite, two IBM 3090s, a disaster-recovery center in Philadelphia and a node on New Mexico's state data communications network came together earlier this year as elements in a novel disaster-recovery method.

According to participants in the test, which was successfully completed in late May, the trial was the first time very small-aperture terminal (VSAT) technology has been used to back up a state government data network. The VSATs and the Philadelphia backup center were provided by Sungard Recovery Services, Inc., which used its new Switched Satellite Service.

Sungard's customer in the test was Ford Aerospace & Communications Corp. subsidiary BDM Corp., which has been providing information systems services and support for the state of New Mexico's Human Services Department under a state contract that BDM won last May.

According to Jack Hall, BDM's director of information services and the person in charge of the Albuquerque data center, BDM's contract called for the development of a disaster-recovery plan with some stringent requirements.

"Under the disaster plan, our requirement from the state is to have a partial system up within three days and the entire system up in two weeks," Hall said. But in designing the plan, Hall continued, it was easier to bring the

entire network up at once.

That five-node network uses leased capacity from Technet, a T1 backbone network operated by the state of New Mexico. With 1,200 attached devices, the network handles 230,000 to 300,000 transactions per day, according to Hall, yet to accomplish an "all-at-once" restoration meant very high-speed data communications.

## Easy way to add capacity

"At the initial study point," Hall said, "satellite wasn't available, so we looked at T1 circuits." As it happens, the cost of running dedicated T1 circuits to reach the AT&T Accunet Reserve favored the terrestrial approach. However, Hall chose the satellite because, he said, it gives him an easier, less expensive way to add capacity should the network need to expand in increments less than a full T1.

Sungard's satellite service provides T1 circuits using a single-channel per-carrier access method. According to Sungard, the switched service — which can be turned on within a few hours — is more economical than the point-to-point dedicated VSAT services offered by other disaster-recovery vendors.

Like other VSAT services, Sungard's represents an alternative to terrestrial facilities. Although it could be argued that a T1 transported through a satellite is less vulnerable than one carried over a terrestrial line, this is not the prime selling point of the satellite services, according to Jim Domanico, vice-president of product development.

"The product is targeted to-

ward corporations that happen not to be near switched T1 services," Domanico said, adding that Sungard has found many companies "even in moderate-size or small cities" with this requirement.

Sungard's first test of the VSAT product in April matched this scenario exactly. The test involved Sungard customer Deposit Guaranty National Bank, Mississippi's largest bank. From a 2.6-ft. VSAT dish at the bank's Jackson, Miss., data center, a T1 transmission was sent to a second VSAT dish on top of Sungard's disaster-recovery center in Chicago.

The bank, which had previously used multiple dial-up 56K-byte lines to reach the Chicago center, now uses a single T1 VSAT circuit at a savings of about 27%, according to Wayne Hillard, the bank's vice-president and manager of communications.

Domanico noted that while Sungard looked at VSAT approaches as far back as 1982, its research and development was accelerated by the Hinsdale, Ill., central-office fire last year, which sent shock waves throughout the IS community.

To achieve national availability, Sungard's service uses two satellite products, GTE Communications Co.'s Spacenet and Racal-Milgo, Inc.'s Skynetworks.

The VSAT option costs \$3,000 to \$5,000 per month, with a usage charge of \$400 to \$500 per hour. The service can be configured to send the T1 to a second company location and can be set up to handle voice communications, according to Sungard.

## NEW PRODUCTS

### Modems

Microcom, Inc. has introduced a V.32-compatible modem card for its High Density Management System (HDMS).

According to Microcom, the HD/V.32C modem will provide up to 38.4K bit/sec. serial speed and throughput over 30K bit/sec. on dial-up lines.

The product reportedly uses full-duplex CCITT V.32 modulation and offers various alternative standards. Network management features are said to include real-time monitoring, call progress, security monitoring and trouble-shooting aids. The price is \$3,399.

**Microcom**  
500 River Ridge Drive  
Norwood, Mass.  
02062-5028  
617-551-1006

### Local-area networking hardware

Able Computer Communications has introduced a front-end processor that reportedly turns a Digital Equipment Corp. Decserver 500/550 into a twisted-pair Ethernet host.

According to the company, the FP106 Front End Processor allows the server to be configured to its full capacity of 128 lines while retaining full modem control. As many as 3,600 users can share the 128 ports by connecting the FP106 to an Able NC3600 Network Manager.

The price for the FP106 is \$2,600.  
**Able Computer**  
2567A S.E. Main St.  
Irvine, Calif. 92714  
714-553-1188

Storage Dimensions, Inc. has introduced hard-disk subsystems with capacities reaching 2.6G bytes designed for Novell, Inc. networks and storage-intensive DOS-based applications.

The Speedstor AT4-2600S for DOS and the Lanstor LAN4-2600S for Novell Network reportedly use 651M-byte hard disks in one-, two- or four-drive configurations, use the small computer system interface and offer average access times of 16.5 msec and data transfer rates of 15M bit/sec. According to the company, all subsystems are shipped with the necessary cabling, host bus adapter, installation software and documentation.

List prices range from \$7,965 for a single-drive external subsystem to \$31,930 for a four-drive external subsystem.  
**Storage Dimensions**  
2145 Hamilton Ave.  
San Jose, Calif. 95125  
408-879-0300

North Hills Electronics, Inc. has announced a multistation access unit (MAU) for Token-Ring local-area networks.

Called the LAT2927 model, the passive, eight-lobe MAU reportedly complies with the IEEE 802.5 Token-Ring specification and is compatible with the IBM 8228 MAU, P/N 6091014. According to the company, the MAU supports both copper and fiber-optic repeaters, IBM 8218 and 8219, respectively, and operates at either 4M or 16M bit/sec. data rates.

The MAU is capable of being mounted in a standard 19-in. rack, and its list price is \$599, the company said.

**North Hills Electronics**  
1 Alexander Place  
Glen Cove, NY 11542-3796  
516-671-5700

**Network Computing Devices**  
Inc. has introduced an X Window System-based network display station with a 19-in. diagonal

screen and a resolution of 1,280 by 1,024 pixels that has been designed specifically for network computing environments.

According to the vendor, the NCD19 Network Display Station joins the firm's 16-in. display in the X Window-based family.

The display station's 32-bit MC68020 processor provides users with a larger "landscape" format display as well as higher resolution and better performance.

The NCD19 can reportedly display two full pages of text and graphics side by side and simultaneously access multiple hosts running the Unix, VMS or Ultrix operating systems. It also supports Ethernet.

Pricing starts at \$3,750.  
**Network Computing Devices**  
350 N. Bernardo Ave.  
Mountain View, Calif.  
94043  
415-694-0650



## Gateways, bridges, routers

Rabbit Software Corp. has announced Rabbitgate II 3299, the latest member of its Rabbitgate family of local-area network gateway products.

The product provides 40 IBM Systems Network Architecture host sessions per gateway via a Type A coaxial connection to an IBM controller, the vendor said. As many as 16 Rabbitgate II gateways can reportedly be installed on an individual LAN to provide a total of up to 640 sessions per LAN. The product consists of an adapter board, gateway software and workstation software and is priced at \$5,995.

**Rabbit Software**  
7 Great Valley Pkwy. East  
Malvern, Pa. 19355  
800-722-2482

Icot Corp. has upgraded its remote-terminal emulation product line.

Designated Ksaver XL, the product line reportedly targets personal computer and local-area network-to-mainframe installations that are faced with memory constraints that are caused by using large DOS applications.

The Ksaver XL supports one terminal session and requires 40K bytes of PC memory, Icot said.

Single-user versions sell for \$750 (Synchronous Data Link Control) and \$850 (X.25.) Gateway versions list for \$1,595 (8 LUs) to \$3,595 (32 LUs) for

both SDLC and X.25 varieties, the firm said.

**Icot**  
P.O. Box 5143  
3801 Zanker Road  
San Jose, Calif. 95150  
408-433-3300

Performance Technology Development, Inc. has announced Powerbridge software package.

The product reportedly links any two or more topologically different IBM Netbios networks together so that a workstation or server on one network can access any shared resource on another. Powerbridge is priced at \$495.

**Performance Technology Development**  
800 Lincoln Center  
San Antonio, Texas 78230  
512-349-2000

## Local-area networking software

Users can establish Apple Computer, Inc. Appleshare networks without using a dedicated server by using software from Information Presentation Technologies, Inc.

According to the vendor, the Personal Server Network allows an Apple Macintosh, IBM Personal Computer or Unix workstation on a Localtalk or Ethernet network to function as both server and workstation while maintaining compliance with the Appletalk Filing Protocol. Pricing starts at \$149 per server; quanti-

ty discounts are available.

**Information Presentation Technologies**  
Suite 2008  
23801 Calabasas Road  
Calabasas, Calif. 91302  
818-347-7791

## Electronic mail

Hitachi America Ltd. has added two facsimile machines to its fax line and has announced price reductions.

According to the vendor, the Hifax 47 enables users to scroll through a list of names and phone numbers in a "dial bank" on a large LCD, thereby eliminating the need to rely on an abbreviated call list.

According to the company, the machine automatically sends the fax document to the selected number, using data compression to transmit to another Hifax in nine seconds. The price is \$2,895.

The Hifax 38 can record an eight-second message that identifies the recipient to callers and offers preprogrammed dialing, the company said. The price for the Hifax 38 is listed as \$2,395, it said.

In addition, price reductions give Hitachi a line of faxes with prices ranging from \$2,000 to \$3,000.

**Hitachi America**  
2990 Gateway Drive  
Norcross, Ga. 30071  
404-446-8820

Enable Software/Higgins Group has introduced a local-area network-based scheduling system that reportedly was designed to support wide-area communications.

As part of the company's Higgins integrated office software, the menu-driven module supports scheduling across multiple file servers, uses electronic mail messages for notices and responses, includes a notepad and can be used both for personal and group scheduling, the vendor said.

The module is included in Higgins Version 2.3 with an eight-user license price tag of \$695.

**Enable Software/Higgins Group**  
Suite 101  
1150 Marina Village Pkwy.  
Alameda, Calif. 94501  
415-865-9805

Contemporary Software Concepts, Inc. has announced a system that connects Wang Laboratories, Inc.'s Wang Office System with Tandem Computers, Inc.'s Wordlink.

The VS/Tandem E-Mail Interface allows users of Wang Office to send and receive memos, letters and word processing documents from any user of the Tandem Wordlink system.

It is said to be self-monitoring and provides electronic mail control by a mail system administrator. Pricing starts at \$20,000, depending on number of workstations and system configuration.

**Contemporary Software**  
Suite 114  
6 Valley Forge Executive Mall  
676 E. Swedesford Road  
Wayne, Pa. 19087  
215-687-6000

## Network management

Telco Research Corp. has announced a line of micro-based telecommunications

management products called the Tru System II.

The line reportedly offers an SQL relational database, which in turn, allows provision of a custom report generator. Other features are said to include expert systems functionality, a Microsoft Corp. Windows-based graphical mouse-driven interface and a hypertext-based Help system.

According to the vendor, applications are included for configuration management of the network, management of multivendor private branch exchanges (PBX) and Centrexes, as well as providing text-based statistical reports and graphic-based reports on PBX and Centrex traffic.

The price usually ranges from \$4,000 to \$30,000, depending on system configuration and call volume.

**Telco Research**  
1207 17th Ave. South  
Nashville, Tenn. 37212  
615-329-0031

Madge Networks Ltd. has announced a terminate-and-stay resident management and control program for Token-Ring networks. Compatible with IBM's Systems Application Architecture, the Madge Ring Manager reportedly was designed to detect and log physical faults, security problems and invalid operations. Requiring 100K bytes of memory, the menu-driven product can run in the background mode from workstations on a local-area network, the company said.

Madge Ring Manager is available now and costs \$1,295.

**Madge Networks**  
534 Salem Ave. S.W.  
Roanoke, Va. 24016  
703-982-0638

## Links

Wollongong Group, Inc. recently announced its latest version of WIN/NFS for Digital Equipment Corp. VMS environments.

Release 1.3 is reported to be compatible with both VMS 4.7 and 5.0 and also provides support for the XDR/RPC programmer library interfaces specified by Sun Microsystems, Inc., according to the vendor. The product's data- and file-handling options have also been enhanced.

The latest release was scheduled for availability in April and will be issued as an update to WIN/NFS customers currently under support at no extra charge, the company said. WIN/NFS for VMS is priced between \$1,000 and \$9,000, depending on DEC VAX processor class.

**Wollongong Group**  
1129 San Antonio Road  
Palo Alto, Calif. 94303  
415-962-7100

A software product that lets developers build job-specific workstations is available from Softbridge Microsystems Corp.

Bridge/386 enables developers to integrate MS-DOS and Microsoft Corp. Windows/386 applications in a multitasking environment under a common graphical interface, the vendor said. The program reportedly can be used to solve specific in-house development problems and as a tool to facilitate micro-to-mainframe communications. An individual Bridge/386 runtime package is priced at \$299.

**Softbridge Microsystems**  
125 Cambridge Park Drive  
Cambridge, Mass. 02140  
617-576-2257

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## EXECUTIVE TRACK



**J. Peter Wenzlick** has joined **The Children's Hospital of Philadelphia** as vice-president of information services. He was previously director of computer services at Borgess Medical Center in Kalamazoo, Mich.

Wenzlick holds a bachelor's degree from Michigan State University and an MBA from Western Michigan University.

**Don Ice** has been promoted to manager of information services and telecommunications at **Owens-Illinois, Inc.** in Toledo, Ohio. A 33-year IS veteran of the company, Ice was manager of computer operations and data communications for the past four years.

Ice replaced Ray Davis, who retired this year after 28 years at the company.

**Eugene L. Bailey Jr.** has joined **Codex Corp.** in Mansfield, Mass., as director of MIS. He was previously director of corporate MIS at Fidelity Investments in Boston.

Bailey spent 20 years in IS at American Can Co. (now Primerica), where he became director of IS. He holds a bachelor's degree from Northeastern University.

**Don A. Rowland** has been appointed director of systems architecture at **The Housing and Preservation Department** of New York City. Rowland was formerly employed at MONY Financial Services in Purchase, N.Y.

### Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor-Management, *Computerworld*, Box 9171, 375 Conituate Road, Framingham, Mass. 01701-9171.

## Supporting the flatter organization

*IS can improve executive decision-making, helping remove layers of management*

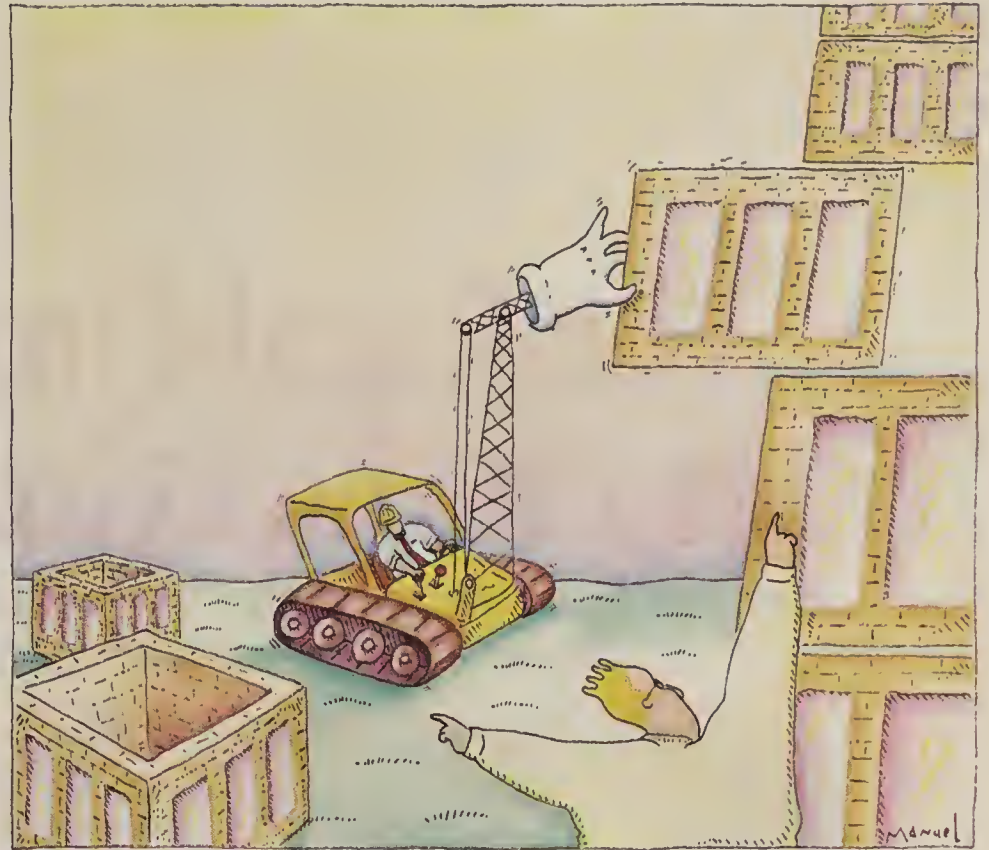
BY ALAN RADDING  
SPECIAL TO CW

In 1982, executives at Xerox Corp. discovered that Japanese competitors were selling copy machines at retail in the U.S. for less than Xerox's manufacturing cost. A study revealed that the Japanese companies had accelerated product development cycles to lower costs.

Xerox began a crash program to create faster product development and manufacturing systems while slashing its headquarters staff by one-third to 400 people. But that was not enough: Management also needed to improve its procedures for reporting, control, planning and implementation.

Key to the streamlining and revised procedures was the new Corporate Information Management group, particularly its enhancement of a corporate database that eventually would anchor a comprehensive executive information system (EIS). "There was an intuitive feeling that technology would help," says Ken Soha, director of executive support systems at Xerox. "Technology is used to support the business while the company is driving down the head count."

Throughout corporate America, top executives are looking at their corporate structures the way Xerox did and are asking themselves how they can do more with less. But flattening alone — reducing layers of management — is not the total answer, says Lynda Applegate, an assistant professor at Harvard University's Graduate School of Business Administration. The real solution, she says, is improving the decision-making process so information is delivered directly to managers who use it to make decisions.



MANUEL KING

If flattening is to be successful, it must be supported by changes in information systems, particularly EISs, says David Goldstein, assistant professor of MIS at Boston University's School of Management.

"You've got to get top managers the information that in the past they got through the middle management layer," Goldstein says.

In the case of Xerox, the information path to top management had to be streamlined to allow top managers to quickly absorb a great deal of information from a variety of sources. One specific objective was to eliminate the time top managers wasted at an endless stream of lengthy presentations

from the business divisions.

Today, 60 Xerox executives use EIS, which includes electronic mail, a meeting-preparation module and a database. About 100 other line managers and staffers have access to parts of the system for reporting, and the company is preparing to extend it further into the organization.

At Phillips Petroleum Co. in Bartlesville, Okla., an EIS that supported a flattening effort had just the opposite objective. The system was designed in part to provide information to line managers in the field so they could set prices in the volatile global petroleum markets on a daily basis.

*Continued on page 64*

## Tech training reaches out at General Mills

BY CLINTON WILDER  
CW STAFF

At General Mills, Inc. in Minneapolis, Mary K. Crozier has found a unique way to bridge the gaps between information systems and the company's business divisions. She has done it with a program that aims to bridge a very different kind of barrier — the wall separating minorities from employment opportunities requiring technical skills.

Crozier, training manager at General Mills' 230-employee corporate IS division, started a program last year to train Minneapolis-area minority members in word processing, computer awareness and interpersonal office skills. After successfully completing a three-month program, the interns can apply for full-time job openings in Gen-

eral Mills' business divisions. Eight of the 10 interns who have completed the program have been hired.

For her efforts in founding the General Mills Mentor Program, Crozier has received the second annual Developing the Human Side of Technology Award from Ouellette & Associates, a Bedford, N.H.-based consultancy specializing in human resources issues in IS.

"I knew it could be done; it was as simple as that," Crozier says of her reasons for starting the program. "Even if the interns don't get a job with General Mills, they gain additional skills and experience to go out and market themselves."

In addition to community outreach,



**General Mills' Crozier**

the program helps General Mills by forging links between IS and the business units. During the training period, each intern is assigned a volunteer mentor who helps with on-the-job adjustments after the intern is hired.

Even though the program is administered by the IS division, all of the intern placements have been

in other divisions.

"I think it's done a marvelous job of team-building across functions in the company," Crozier says. "Top management has really allowed a lot of people to go over and above our standard job descriptions to make sure it happens."

The program will start its third three-month training period this fall.



# Corning studies peer-to-peer support

BY CHARLES VON SIMSON  
CW STAFF

CORNING, N.Y. — Ruth, a 32-year customer service employee at Corning, Inc., was not too fond of the computer system. She had a habit of hitting a combination of keys that caused her terminal's screen to go blank. Normally, Pearl, who worked at the next desk, would fix it. However, with Pearl away one day, Ruth ended up calling information systems support personnel in no less than three departments to come and help her with the problem.

Carol Hartwig, manager of client cus-

tomers services in the IS division of Corning, estimates that those visits of support personnel cost Corning about \$300. Thus, Hartwig wants to formalize the kind of support that Pearl usually gave to Ruth by setting up a network of end users at different levels of sophistication that can be called upon to offer help with systems problems in their departments.

According to a Corning survey, end users were already more comfortable dealing with each other than with any other formal IS function. "We are not asking people to take over technical support," Hartwig said. "We are only asking them

to do what they already do better than us."

The formalization of support that end users give each other is an idea that has been explored in management books and pilot programs, but Hartwig and Corning IS Director Harvey Shrednick said they believe that an attempt at companywide implementation is unique to Corning.

"This is the first shot at a large-scale pilot," Shrednick said. "It is still moving slowly, but we hope initial success will allow us to accelerate its implementation in other parts of the company."

To implement the idea, Hartwig and

consultant Barbara Braverman, president of Computer Thinking, a Rochester, N.Y., consultancy, created a steering committee of selected non-IS business managers and supervisors of IS support staff. The committee established the criteria for effective support and chose one of Corning's customer service departments as the pilot area for the project.

Users are classified as novice, mentor and facilitator, each with increments of more responsibility and greater expectations placed on them for the type of support they can provide. While the definitions of each area are fairly loose and are expected to vary from organization to organization, there are some general guidelines.

The mentor is an aide to the novice, having a strong understanding of applications in his area. The facilitator is a "power user" who has at least some understanding of basic technology. He also understands both the structure of IS and his own organization and acts as a liaison between the two groups.

Early estimates are that an average mentor, the intermediate level of support responsibility, is likely to spend 5% to 8% of his time in a support role.

"Most said that they did not want to take the step unless the responsibility was built into their [job description]," Braverman said.

With the support of division management, Braverman and Hartwig used a prototype survey to poll users on effectiveness of support. "Users were clearly supporting each other," Braverman said, "but we didn't know how or how effectively."

## My friends are important

The survey revealed that end users were significantly more comfortable dealing with each other than with formal IS support or their managers or with consulting a manual. "The fact that people would go to peers with problems, rather than IS professionals, we found surprising," Shrednick said. "They didn't need a handholder with an IS inscription across their forehead."

Corning's pilot program will be completed in October, and Hartwig said she hopes by then to get approval for a more wide-scale rollout of the plan. Picking a good area of the company that shows the potential of the idea is critical.

"Corning is such a volatile company that we wanted to make sure that we were using a stable staff and organization," Hartwig said. "It is important to be careful about who you select."

Acceptance of the idea is unlikely to go without a hitch. Hartwig concedes that some managers chafe at the idea of having extra responsibility for IS support, but she counters that they will simply get formal recognition for something they already do.

Shrednick has pledged support for the project and said he has a great deal of enthusiasm for its potential impact on the company. "As this gains momentum, we will take a hard look at the data from the pilots," he said. "I believe it will be a central part of our strategy for the 1990s."

Ultimately, the goal of the project is to hold the fiscal line on support as the number of sophisticated users grows geometrically. "We have been told that we are facing a budget that is flatter than the eye can see," Hartwig said. "The challenge is to increase IS presence without increasing IS staff."

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# Selling big IS projects to the boss

BY ALAN J. RYAN  
CW STAFF

When manufacturing companies' information systems chiefs go to the top for approval of long-term factory-floor projects, they should bring two things with them: their homework and the truth.

Half the battle of getting a project approved "is doing a sales job to the executive management," said Scott Lee, manufacturing systems manager at the Medical Products Division of Welch Allyn, Inc. in Skaneateles Falls, N.Y. That allows executives to "appreciate and understand the pieces that are going to move you toward the technology they hear about [at] their executive breakfasts," he said.

Lee said that his company, like most, faces the common problem of workers who are resistant to change. "One of my most important roles is watching the environment and making sure I am tuned in to how people are perceiving the systems. I make sure we have everybody on board," he said.

The other half of the battle, said William R. Kuh, manager of systems integration at Textron

Lycoming in Stratford, Conn., is conducting the background research. "We started our project 7 years ago," Kuh said. "The first two years were spent planning, and the last five years have been the implementation."

Textron Lycoming recently completed a \$15 million project to overhaul and completely modernize its turbine factory operation where it builds tank engines for the U.S. government, Kuh said. "We had a sound analysis of what we were going to do and were able to understand and predict the benefits," he said.

## MAP on the floor

A 1½-year research project at Aluminum Company of America's Tennessee Operations in Alcoa, Tenn., is what helped gain approval for a project there to use Manufacturing Automation Protocol technology on the manufacturing floor.

The project, completed after three years, created a materials handling system that used existing floor space rather than requiring new floor space for manual systems, said Kenneth G. Main, Alcoa's senior staff electrical engineer.

"You have to go in [to senior

management] and make sure you address all of your requirements and understand what you think you're going after," Main said.

Still, Main said, even substantial planning cannot eliminate the problems. "This was an opportunity to tackle the technology," he said. "Once we got it here, there were more hidden things than anticipated, but we weathered the storm."

The easiest way to sell a big project is to simplify it, said James Mottern, a partner at Ernst & Whinney Management Consulting Services in Irvine, Calif. "Sometimes, the project is too ambitious in what it is trying to achieve. It might be more successful if broken down into logical supporting phases," he said.

At Welch Allyn, Lee said he did just that. A three-year computer-integrated manufacturing project that began with eight months of study is being completed and is already showing tangible results after two years. The payback includes a fourfold reduction in back orders to customers of medical diagnostic instruments and an decrease in downtime of tooling machinery in the company's metals fabrication shop.

## TAKING CHARGE

Alan J. Ryan

## Asset semantics



My definition of the term "gaffe" now reads: Any written communication that uses the terms "information" and "technology" interchangeably.

Back in June — reporter's notebook and ballpoint pen in hand — I attended a forum for IS executives in New York. I subsequently wrote an article about a session on how the vast majority of corporate executives are really not turned onto technology and how that problem could eventually hurt the company's financial future.

It seems that in my frantic note-taking, I committed a gaffe, by my own definition. Every time the speaker said "information," I automatically abbreviated it "IT" — for "information technology."

What I should have written, according to Brenda Lewis, who gave the presentation, was that only 5% to 10% of top executives in Fortune 500 companies

truly accept and use "information" as an asset on par with cash, technology, human resources and physical plant.

Sure, companies have valued their information in one way or another for as long as they have had it. Accounting, which just might be the second-oldest profession, has always been responsible for lots of financial data. So what is different today, and what are these top execs Lewis spoke of doing wrong?

## Hard to get

Lewis, who is president of Transactions Marketing in Greenwich, Conn., says the problem has been — and continues to be at many corporations — that much of the information is inaccessible. When you can't get to it, you can't appreciate its value. It might be stashed in the sales manager's head, buried within a stack of similarly important information in one file cabinet or trapped within a research study or report.

Such fragmented information is the main reason why IS professionals have to find user champions who are highly placed within the organization. Only with top-level support can that information be retrieved from the dark file cabinets and shared with users who need that information, Lewis says.

"They key is to find the senior guy to say, 'We've got a lot of information around this place, but it is not getting to the decision makers. What can we

do about that?'" she adds.

If a firm's senior managers accept information as an asset and begin using it as such, they are also building prestige for those who support that information. "In the future, the ambitious information technologies professional will seek to work in an organization where information is accepted as an asset," Lewis says. "In such an environment, the IT function will be highly valued, since it will be the IT role to deliver the information asset into the hands of an increasingly mobile, sophisticated user."

Further, Lewis says, in that kind of an environment, it is probable that the IS professional would enjoy equal status with the firm's chief financial officer or the senior marketing officer.

The next logical step, of course, would be to establish guidelines by which all of this information can be valued in dollars and cents. There is at least one association undertaking that project right now. If that happens, firms will look to their insurance providers to ensure this newfound wealth. When that day arrives, let's just hope the insurance documents clearly spell out what is covered.

Oh, yes, you also may want to be sure that wherever the word "information" is supposed to show up that it isn't spelled t-e-c-h-n-o-l-o-g-y.

Ryan is a *Computerworld* senior writer.

"Each time we want to implement more technology, we still have to justify it," Lee said. "But we haven't been asked why we should be doing this. That showed us we had laid the right groundwork three years ago."

Breaking the project down makes sense, Mottern said, because during the time it might take to implement a four-year project, there could be a significant change in management. "If your executive sponsor changes or leaves, people may lose sight of what they want to do," he said. Equally important, he add-

ed, is allowing the manager assigned to the project to consider it a priority and to stick with it.

But once any project is approved, there is still a lot of work ahead. "We're still not done justifying our system," Lee said.

Additionally, the person in charge of the project may find himself asking for money not associated with the hardware or software phases of the project. "Close to 15% of our efforts went to training people — mostly in the maintenance and interface areas of the system," Main said.

## Tactics

Although an investment in factory-floor information technology is not likely to yield many tangible results for months or even years, there are some ways to sell it to top execs. Here are some suggestions from those who have been through the process:

- Make sure the goal of the project echoes the goal of upper management.
- Do not invest in an elegant system that will be underutilized.
- Conduct a thorough analysis of what the project will involve and achieve.
- Examine the proposed project to see if there are ways it can be simplified before it is automated.
- Examine how workers will be affected by the proposed project and then educate them.
- Break a large project into many smaller, shorter term projects that will show early results.
- Set up a realistic time frame in which to complete the project, and be realistic in terms of financial savings and productivity gains it will achieve.
- Find a strong manager to oversee the project, and make it a priority assignment.
- Be flexible enough to let the original plan evolve with new technologies.

ALAN J. RYAN

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## Flatter

FROM PAGE 59

Previously, Phillips had established prices centrally, which took several days. That kind of delay could result in lost market opportunities — missed sales if prices were too high and relinquished profits if they were too low.

The restructuring at Phillips was triggered by two hostile takeover attempts in the mid-1980s. The raiders were defeated, but the company was saddled with enormous debt, which jumped from 20% to 80% of its total capital. In the streamlining that followed, Phillips reduced its 14 divisions to nine and slashed management and its sup-



Harvard's Applegate

port staff by 40%.

The Phillips EIS is intended to deliver information that managers need to make decisions quickly, providing sufficient detail but avoiding the need for them to wade through raw data, according to Linda Davidson, Phillips' supervisor of corporate executive information systems.

In the past, middle managers massaged data and often delivered reports lacking in detail, Davidson says. Phillips devised a series of reports and graphs to present the standard summaries and exception reporting in a format executives could immediately recognize.

Initially, there were 20 to 30 basic reports and graphs; today, the system offers more than 2,000, Davidson says. Executives choose the reports and information they want.

The EIS has helped managers in an unforeseen way, Davidson says. Because it gives the executives a sense of greater control, they are more comfortable delegating responsibility and authority, she says.

Many middle-management layers were created before the introduction of computers to collect, synthesize and disseminate information. As they are eliminated through flattening, information systems can help fill the gap, Goldstein says.

For instance, in the past, if a top corporate headquarters executive wanted information about 20 plants around the world, he would turn to regional



Xerox's Soha

managers to collect and synthesize that information. With an executive support system, that executive may be able to get to that data in moments by himself.

To support flattening and allow information to flow directly to top management, IS organizations need to change their emphasis from transaction processing to decision support, Goldstein says.

Before IS organizations can develop a new architecture to support flattening, however, they need to establish the structure of the flattened organization itself. First, the organization probably has to establish a smaller number of critical goals and focus on them. "You can't do everything at the same time," says Charles V. Callan, a principal at consulting firm Index Group, Inc. in Cambridge, Mass.

Then, the organization must think differently about role definition and career development. "When an organization flattens out, everybody becomes a player-coach" and IS directs the flow of information between "self-managed teams of doers," Callan says.

Traditional information systems serve the classic hierarchical management structure in which raw data is increasingly filtered and synthesized as it is reported up the chain of command. "Span and control" is the term for the hierarchical structure in which there is one manager for every five to eight subordinates. It is this structure that is impeding many organizations today, proponents claim.

By using systems to increase the span that a manager can control, executives at the Suburban Propane Division of Quantum Chemical Corp. in Whippany,



BU's Goldstein

N.J., believe the company can grow without adding new layers of management. Suburban Propane's EIS is designed to double the number of subordinates reporting to a regional manager, according to Frank Kasel, the company's vice-president for MIS.

Rather than justify their system on the basis of managers laid off, Suburban Propane executives saw it as a way to expand the business profitably without having to expand management in proportion, Kasel says.

Suburban Propane, which operates 460 business units in 44 states, uses the system to bridge the gap between headquarters and managers in the field through direct access to a central mainframe database. Executives at headquarters track daily sales activity through exception reports on prices and other variables; previously, they received printed daily sales reports "subject to the vagaries of the U.S. mail" and monthly reports subject to production delays, Kasel says.

In a rapidly shifting business environment, the trick for IS is to develop systems that are independent of the organizational structure. "You need flexibility. You must watch out if the new system presupposes certain changes in the organization," Callan warns.

Politically, flattening the organization and expanding the use of information systems has to be approached delicately. "You couldn't just pull people out and say you were replacing them with technology," says Soha, although that is what happened at Xerox. To sell the new technology, Xerox management con-

## EIS as a corporate hammer

Some prerequisites for using EIS to flatten an organization

- ☒ A flexible systems architecture
- ☒ Leadership from top management
- ☒ Focus on a few corporate goals
- ☒ Redefinition of roles and careers
- ☒ Systems for small-scale streamlining

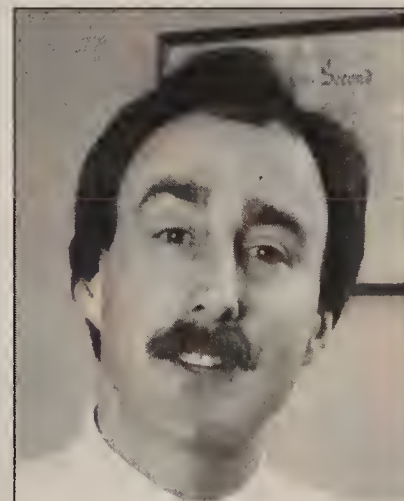
Some EIS functions that can curb wasteful meetings

- ☒ Filtering of data into standard reports
- ☒ Presentations customized for individuals
- ☒ Interactive access to structured information
- ☒ Meeting preparation and scheduling
- ☒ Electronic mail

CW CHART: FRANK C. O'CONNELL

tended that staff roles would change for the better — that the technology would eliminate the staff's mundane information channeling and free them for more challenging work. The hardest part was "getting the head set to change — getting people to accept a new way of doing things," Soha says.

The results have been encouraging, he adds. Xerox has regained market share against the Japanese in key areas, and employees now view information as a company asset, Soha says. Xerox is expanding the cor-



Index Group's Callan

porate database by tapping external sources for market research and information on competitors.

While IS plays a vital role in the flattening of an organization, it is unlikely that IS will or should take the lead on the issue. Callan brought up the question of flattening to a meeting of 36 top IS executives and found that they unanimously agreed that IS must not take the lead in such an effort.

Any such initiative must be launched from the top of the company, with IS in a supporting role. At Xerox and Phillips, top corporate executives took the lead in supporting flattening efforts and accompanying information systems.

IS, however, can help pave the way for corporate flattening by producing systems that provide flattening on a small scale, Callan suggests. For instance, IS efforts to eliminate paper and the need for paper handlers can generate efficiencies that result in a degree of flattening. "IS should continue to look for opportunities for process compression — anything that reduces the number of steps something takes," Callan says.

Despite the gains to be made through flattening and systems to support it, the step can be a difficult one for an organization to take. "Change is terrifying. What if the company flattens and then discovers it can't conduct business?" Callan says. The right IS system can help ensure that does not happen.

Radding is a Newton, Mass.-based author specializing in business and technology.

## MANAGEMENT BRIEFS

# Smith to join NCGA education board

Christine D. Smith, director of corporate and foundation resources at Lehigh University in Bethlehem, Pa., has been appointed a director on the board of trustees of the National Computer Graphics Association (NCGA) Educational Foundation. In the position, Smith will conduct foundation fund-raising and will assist in program development.

Funding raised by the NCGA in the past has been used to make a \$20,000 donation to the Computer Museum in Boston and a \$6,000 donation to support University Programs in Computer-Aided Engineering, Design and Manufacturing '89, a conference that focuses on networking CAE applications. The NCGA Educational Foundation has also awarded 50 scholarships to NCGA's annual conference and

exposition for the past two years.

The Society for Imaging Science and Technology (SPSE) is seeking authors to present papers related to imaging science and technology at its 43rd annual conference slated for May 20-25, 1990 in Rochester, N.Y.

Topics to be addressed at the conference are electro-optical imaging systems, computer imaging and digital graphics, color proofing systems, advances in image processing techniques, electronic photography, color theory in imaging, chemical imaging processes, image compression techniques, electrophotography, image analysis, image permanence and restoration and three-dimensional imaging. The deadline for author applications is Dec. 1.

For an author's application or more information, contact the SPSE at 7003 Kilworth Lane, Springfield, Va. 22151.

Corporate electronic data interchange (EDI) practitioners, EDI educators, EDI service vendors and EDI bankers are invited to submit manuscripts to **EDI Forum**.

The publication, which will be printed once this year and more frequently in 1990, is designed to facilitate conversion of business-to-business communication from voice, paper and mail-based processes to EDI.

For deadline or guideline information, contact **EDI Forum: the Journal of Electronic Data Interchange**, The Marriott School of Management, 670 TNRB, Brigham Young University, Provo, Utah 84602.



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For more information, contact Harris Devlin Associates, 430 Exton Commons, Exton, Pa. 19341-2451.

## AUG. 20-26

**Agricultural Computing Trends for the 1990s Conference.** Indianapolis, Aug. 20-22 — Contact: John Bruns, AACC Executive Director, Box 122, Claytonville, Ill. 60926.

**Computer Associates Systems Software Conference.** New Orleans, Aug. 20-25 — Contact: Caroline Schafer, Computer Associates International, 711 Stewart Ave., Garden City, N.Y. 11530-4787.

**IJCAI-89, American Association for Artificial Intelligence International Joint Conference on Artificial Intelligence.** Detroit, Aug. 20-25 — Contact: AAAI, 445 Burgess Drive, Menlo Park, Calif. 94025.

**Data Capture Technologies: Cost-Effective Alternatives to the Keyboard.** Cambridge, Mass., Aug. 21-22 — Contact: Georgette Asherman, Institute for International Research, Information Technology Division, 331 Madison Ave., New York, N.Y. 10017.

**Improving Your Internal Consulting Skills.** Boston, Aug. 21-23 — Contact: American Management Association, 135 W. 50th St., New York, N.Y. 10020.

**Netview and Netview/PC: Managing Large Networks Seminar.** Los Angeles, Aug. 21-22 — Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402-2899.

**Deals, Dangers, Directions: Lessons of the High-Tech Industry.** Santa Clara, Calif., Aug. 22-23 — Contact: Dataquest Conference Department, 1290 Ridder Park Drive, San Jose, Calif. 95131-2398.

**Uniforum trade show and conference.** Boston, Aug. 22-24 — Contact: /usr/group, Suite 201, 2901 Tasman Drive, Santa Clara, Calif. 95054.

**Interactive Videodisc in Education and Training Conference.** Arlington, Va., Aug. 23-25 — Contact: Society for Applied Learning Technology, 50 Culpeper St., Warrenton, Va. 22186.

**Strategic Management of Technology for the 1990s.** Columbus, Ohio, Aug. 24 — Contact: Diane Sotos, Battelle, 505 King Ave., Columbus, Ohio 43201-2693.

## AUG. 27-SEPT. 2

**Nuclear Information and Records Management Association Symposium.** Minneapolis, Aug. 27-30 — Contact: Jane Hannum, NIRMA Administrative Office, 210 Fifth Ave., New York, N.Y. 10010.

**Long Range Information Systems Planning.** Chicago, Aug. 28-30 — Contact: American Management Association, 135 W. 50th St., New York, N.Y. 10020.

**Southeastern Telecommunications Association Annual Conference and Exposition.** Nashville, Aug. 28-30 — Contact: Trade Associates, Suite 200, 12250 Rockville Pike, Rockville, Md. 20852.

**XI World Computer Congress.** San Francisco, Aug. 28-Sept. 1 — Contact: 11th World Computer Congress,

Convention Service Center, P.O. Box 18-P, Denver, Colo. 80218.

**Acquisition of a Digital Image/Optical Disk System.** Arlington, Va., Aug. 29 — Contact: Tracey Hubbard, National Trade Productions, 313 S. Patrick St., Alexandria, Va. 22314.

**National Seminar Series on IBM's AIX.** New York, Aug. 29-31 — Contact: Patty Price, Locus Computing, 9800 La Cienega Blvd., Inglewood, Calif. 90301-4440.

**Surface Mount '89.** San Jose, Calif., Aug. 29-31 — Contact: Surface Mount Technology Association, Suite 107, 5200 Willson Road, Edina, Minn. 55424.

**The Three Rs of Software Automation: Reengineering, Repositories, Reusability.** Chicago, Aug. 29-31 — Contact: C&F Management, Suite 402, 372 W.

Ontario, Chicago, Ill. 60610.

**Overview of Information Engineering.** New York, Aug. 31 — Contact: James Martin Associates, Suite 200, 1850 Centennial Park Drive, Reston, Va. 22091.

## SEPT. 3-9

**USENIX Large Installation Systems Administration Workshop.** Austin, Texas, Sept. 5-8 — Contact: USENIX Conference Office, Suite 613, 22672 Lambert St., El Toro, Calif. 92630.

**Achieving Success in Strategic Planning.** St. Louis, Sept. 6-8 — Contact: Robert J. Benson, Washington University, Campus Box 1141, One Brookings Drive, St. Louis, Mo. 63130-4899.

**Federal Microcomputer Conference and Exposition.** Washington, D.C., Sept. 6-7 — Contact: Fed Micro '89, National Trade Productions, 313 S. Patrick St., Alexandria, Va. 22314.

**Breakaway '89.** Orlando, Fla., Sept. 6-9 — Contact: ABCD, the Microcomputer Industry Association, 1515 E. Woodfield Road, Schaumburg, Ill. 60173-5437.

**International Enterprisewide Information Management Conference.** St. Louis, Sept. 6-8 — Contact: Scott Schaeffe, Center for the Study of Data Processing, Washington University, Campus Box 1131, One Brookings Drive, St. Louis, Mo. 63130-4899.

**Legal Issues in Information Technology: An Advanced Workshop.** Washington, D.C., Sept. 6-8 — Contact: Vern Lautner, 135 W. 50th St., New York, N.Y. 10020.

**Optical Information Systems Conference and Exhibition.** Arlington, Va., Sept. 6-8 — Contact: Kim Grega, Meckler Conference Management, 11 Ferry Lane West, Westport, Conn. 06880.

**PCs vs. Workstations: The Battle for Second-Generation Computing.** Santa Clara, Calif., Sept. 6 — Contact: Kathy Collins, International Data Corp., 5 Speen St., Framingham, Mass. 01701-9908.

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## Easing paper flow could help slash DOD budget

*Defense initiative to offer electronic exchange of technical product info*

BY PAUL N. PECHERSKY

**A** technician carrying a laptop computer walks toward an airplane that has just arrived for routine maintenance. He approaches the plane and unlocks a side panel. He places the computer on the panel, opens it, extracts a cable and plugs the cable into the plane. Also inside the panel is a small optical disk platter that he removes and inserts in the side of the computer. The disk contains the configuration and product support information for this specific airplane, including information about the airframe, engines, avionics, command-and-control systems and armament.

The technician turns on the computer, and an automatic analysis of all the components is performed. Each component has a built-in microprocessor that has been monitoring its performance. In a few minutes, an automated guided vehicle appears next to the technician. During the analysis, the computer had discovered a bad component and automatically notified a computer in the warehouse, via digital radio wave, to send a replacement part.

The computer asks the technician to confirm that the serial number of the new part is the same as that appearing on the screen. Then, a graphic appears showing where the part should

Pechersky is corporate director of MIS at E-Systems, Inc., a Dallas-based defense contractor.



DAVID POVILAITIS

be inserted and provides specific instructions on how to remove the old one and replace it.

But while installing the new part, the technician encounters a problem. He depresses the Help key and then answers a series of simple questions that appear. Using the responses, the computer's artificial intelligence assists the technician in resolving the problem. After the new component has been successfully inserted, the system conducts a self-check and updates the configuration file to indicate that the new part is working. The technician then removes the

platter from the computer, replaces the panel, disconnects the computer and closes the panel: Maintenance is complete.

The scenario presented above is not as futuristic as it may seem. It is coming in the next 15 years from the U.S. Department of Defense (DOD).

While we've all heard of electronic data interchange (EDI) and how companies are exchanging purchase orders and invoices via electronic technology, the DOD is developing its own version, with a new twist. The DOD is exchanging technical product

documentation with defense contractors. It is a capability that will eventually result in many situations similar to that above.

The technique will also ultimately emerge in the commercial sector, especially in manufacturing, and many information systems managers will have responsibility for it in their companies.

The concept making this possible is called computer-aided acquisition and logistics support (CALS). CALS is a DOD initiative undertaken to achieve significant cost savings over weapons systems' life cycles by applying existing and emerging communications and computer technologies to improve productivity, quality and timeliness in product development and support.

It is a strategy designed to effect an evolution from the current paper-intensive process of development to a highly automated method of operation, thus eliminating the roadblocks caused by incompatible islands of automation.

Once implemented, defense contractors will provide deliverables such as technical manuals and engineering drawings in electronic, rather than paper, form.

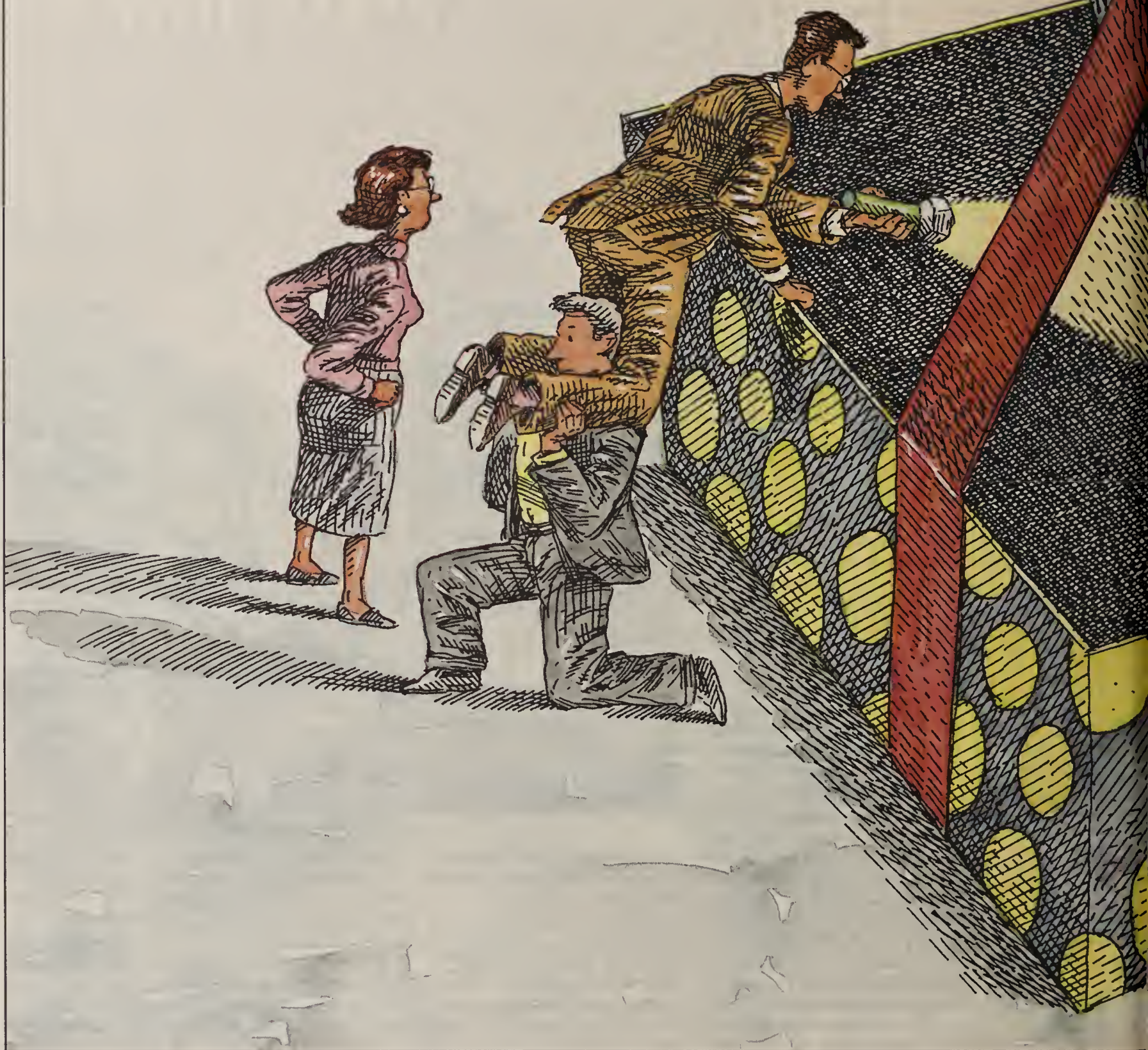
Today, the Defense Department is starting to include CALS requirements in its contracts. Ultimately, the DOD will gain direct access to product-related technical information that is maintained on contractor-owned computers.

In both the commercial and military sectors, CALS is

- Helping ships rise in the water
- Transferrable to the commercial arena
- May save 20% in weapons' life-cycle costs



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CALS began in 1984 when a task force consisting of DOD and defense contractor representatives studied the possibility of extending computer-integrated manufacturing productivity gains to the product support

area. The results of this showed that the primary target for automation and integration was the large volume of technical data required to support a weapons system throughout its life.

The most immediate impact of CALS will be on defense contractors. Cost estimates for technical data delivered with DOD systems range from 10% to 30% of total acquisition costs.

These documents can cost in excess of \$1,000 per page. For example, the B-1B bomber has a total of one million pages of documentation. A U.S. Navy ship carries 15 to 25 tons of manuals. It has been estimated that if this paper were removed, the ship would rise three inches in the water. As a consequence of these and other examples, the DOD intends to make CALS rou-

tine in the way services acquire and support weapons systems.

The DOD estimates of the benefits expected to be derived from this trend are providing significant ammunition for achieving this goal:

- Technical-manual authoring automation is expected to provide a 20% to 30% increase in productivity.
- On-line access to maintenance

information is expected to yield a 35% improvement in troubleshooting accuracy.

- The U.S. Air Force has estimated an expected \$135 million annual savings in technical manual changes.

- An integrated database is expected to reduce logistics support costs by 20% to 35% and overall acquisition costs by 5% to 10%.

- The biggest benefit estimated by the DOD is a 20% savings in weapon systems life-cycle costs.

Although these benefits are intriguing, the question for today's IS managers in the manufacturing sector is whether their companies, not just those that sell to the DOD, should take the trend of electronic interchange of product data seriously. The answer is yes.

In a world of strategic alliances, outsourcing, partnerships and increased product complexity, electronic interchange of product data will affect a product's life cycle in much the same

**T**HE MOST immediate impact of CALS will be on defense contractors. Cost estimates for technical data delivered with DOD systems range from 10% to 30% of total acquisition costs.

way as Henry Ford's assembly line. It will reduce costs, expand market share, increase product quality and provide new products and services.

The whole area of systems integration is the biggest challenge that both commercial and defense-oriented manufacturing IS directors are facing in the U.S. In the past, IS was concerned only with compatibility among internal computer systems. In the future, it must also be concerned with compatibility among trading partners.

The standards and guidelines evolving from the CALS initiative will allow these different computer systems to be functionally and technically compatible. Companies not adopting these generic technologies and standards will find it difficult to participate with multiple trading partners and will also be placed in a disadvantageous technical position with respect to the rest of their industry. In fact, over the long term, adoption of electronic exchange standards and strategies will not be used to gain a competitive advantage but rather to avoid being left with a competitive disadvantage.

But how realistic is it to assume that the commercial sector will embrace CALS? During the past five to 10 years, industry

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has rapidly implemented new technologies, such as computer-aided engineering, design, manufacturing and publishing. But these implementations have led to the problem of islands of automation in the midst of what is largely a paper-based environment. These islands tend to be functionally oriented and often cannot communicate with one another electronically. In many cases, the need for data interchange is being met by paper output and data re-entry, impairing efficiency, timeliness and accuracy.

Thus, the burden of creating, delivering, updating, managing and using this volume of data in hard copy is becoming intolerable. As products become more complex, these problems have added to development and support costs.

Corporate America generates enough paper each day to circle the world 40 times over, and more than half of that comes from computers. Digital exchange will obviously reduce the consumption of paper, but more important, it will reduce the effort required to transfer product design information to the manufacturing process.

The need to input data into multiple databases will be eliminated. Manufacturers will be able to exchange data electronically with their suppliers and subcontractors. They will be able to exchange data electronically between and among manufacturing facilities.

One of the biggest contributions of the automation achievable through CALS is product quality improvement. This increase in quality will be accomplished by influencing the design process to produce products that are more reliable and easier to support and maintain; automating the development, delivery, maintenance and distribution of support products; and reducing the quantity of technical paperwork needed to develop, acquire, support and maintain products. As a consequence, the biggest benefits to industry will be increased productivity and higher quality — both of which should result in increased profits.

#### Depth of impact

There is, however, a large arena in which to implement this new idea. The DOD depends on virtually every sector of the U.S. manufacturing base for material. For instance, in 1985, the DOD purchased \$165 billion worth of goods from 215 different industries. This represented 4.1% of the total U.S. gross national product and 21% of the manufacturing gross national product.

To ease implementation of CALS, where possible, existing standards are being used. For instance, the first two digital interchange standards released by the DOD were the Initial Graphics Exchange Standard and the Standard Generalized Markup Language. Both standards have been in use for some time in the engineering and publishing worlds (see story page 73).

As CALS evolves in the military, these and other standards will be transferred to other federal agencies. In 1988, these agencies spent about \$17 billion on IS, and they have plenty to say about the information technology that eventually becomes available to all users. Given the size of the federal budget for computer-based systems, IS can expect accelerated development of new industrywide standards that will shape the market for computers and telecommunications. Ultimately, these standards and those not yet imple-

**C**ORPORATE AMERICA GENERATES enough paper each day to circle the world 40 times over, and more than half of that comes from computers. Digital exchange will reduce the consumption of paper and will reduce the effort required to transfer product design information to the manufacturing process.

mented will affect the entire discrete manufacturing sector.

As implied, there will initially be limited impact on traditional IS. There are, however, four technologies that will drive the adoption of CALS (see story page 72), and they will involve substantial integration of current processes by IS to take ad-

vantage of a shared database environment in the early 1990s and later.

Today's IS manager must be alert to these new technologies, understand what is going on in the standards world and the realities of vendor compliance and ensure that the organization's mixed investments in systems work well together

in an integrated environment.

This means IS organizations have to supply personnel with a broad-based knowledge of the diverse systems used in business, manufacturing, engineering and research and development. In such an integrated environment, IS will be the custodian of the information, making sure that it gets to the users — whether it be a supplier, a customer or the shop floor — in the right forms at the right times, accurately and securely.

Whether your company is a large manufacturer that designs, develops, manufactures, markets, distributes and supports products or a concern that only performs some subset of these activities, it will be affected by CALS. Even the private sector will be affected. The scenario

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that follows is one example of how electronic interchange of product data may one day affect the commercial products of the future as well as our private lives:

*It's 1994, and you have just settled down for an evening in front of the television. You aim your remote control at the 3- by 5-ft. screen across the room and tap the power button. Nothing happens. You then depress the key marked Help. A backup system enables the TV to present a series of questions that appear on the screen, asking you to describe the problem by depressing the "Y" key for yes or the "N" for no.*

*You answer the questions, and the screen responds by telling you a particular component has malfunctioned and*

*needs to be replaced. You are asked if you would like to repair it yourself or notify a service technician. You choose to have a technician repair it. The screen offers a list of repair personnel. You choose one and tap in a code. An electronic pulse is sent from your remote control into the TV.*

*From there, the signal travels to a shoebox-size device mounted on the side of your house. There, the signal is converted into pulses of light and flashed instantaneously over a hair-thin fiber-optic cable into the neighborhood telephone network. Here, the signal is bundled together with other signals from your neighbors and is eventually sent to the repairman's computer.*

*The repairman's computer conducts*

*a remote diagnostic of your TV, confirms which components are faulty and dispatches a repairman with the proper component to your home.*

*If you had chosen to repair it yourself, an EDI transaction could have been transmitted to the electronic supply stores in your neighborhood to determine which ones stocked the part and then provided you with a price comparison. You could then purchase the part and have the TV's built-in expert system instruct you on how to replace it.*

Today this is fiction, but the technologies are quickly becoming available for this scenario to occur in reality, and the development and implementation of CALS will help. •

## Enabling technologies

The electronic interchange of product data achievable through CALS will be driven by four generic technologies: distributed database management, telecommunications, computer-integrated manufacturing (CIM) and product data management.

First, although full-fledged distributed database management systems have yet to appear, a handful of products are materializing from the vapor of promise and conjecture. When it is available, the concept of transparency, or a user's ability to access data from any point in a network without specifying the location of the needed data, will take hold. Data will be stored wherever it is convenient, and users will be able to access data without knowing where it resides.

The second technology is digital data interchange, specifically electronic data interchange (EDI) and technical data interchange (TDI). EDI is the direct computer-to-computer exchange of business documents — such as invoices, bills of lading and purchase orders — in a standard format. TDI is the direct computer-to-computer exchange of product technical information — such as engineering drawings, training manuals and maintenance manuals — in a standard format.

The third technology, CIM, usually brings to mind large corporations spending millions, even billions, of dollars. But CIM can work for both large and small manufacturers. CIM enables a company to be competitive by lowering production costs and improving quality with less scrap or rework.

CIM can also help a company be more responsive, both to market needs for new products and to customer needs for products and information about their orders.

In the future, using CIM, a manufacturing firm's employees can go to a terminal, look at what has been ordered, check how many pieces are in stock and then track the manufacturing process for that part, the suppliers and, ultimately, the service record for that type of product.

Finally, in terms of product data management, significant investments are being made by the computer industry and the National Institute of Standards and Technology (formerly the National Bureau of Standards) to develop a neutral data exchange standard for product data.

This will permit the practical communication of product data — within a heterogeneous computing environment — among different company functions, among several companies and from a company to its customer.

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# CALS makes an impression in publishing

BY TED BAYNE  
and MOIRA MEEHAN

One of the most visible and mature elements of the computer-aided acquisition and logistics support (CALS) program has been the development and identification of electronic publishing standards. The reason for this is simple: The integrated CALS databases of the future cannot be designed until the structure and format elements of digitized technical documents are defined.

Many of the electronic publishing standards being incorporated in the CALS program are established international or national computer standards. Only as a last resort, where no standard exists at all, is the U.S. Department of Defense willing to develop its own.

The following are standards familiar to the computer industry and the electronic publishing sector:

- Computer Graphics Metafile.
- Initial Graphics Exchange Specification, the computer-aided design and manufacturing format for the representation and transfer of product definition data.
- Standardized Generalized Markup Language, the independent "processor" device that passes actual control of a document to the processors in diverse computer systems.
- CCITT Group 4, the facsimile compression and transmission standard.

Interest in the CALS standards as they apply to corporate electronic publishing and future information systems is spreading fast. David Henry Goodstein, president of Interconsult, Inc., an Arlington, Mass.-based publishing consultancy, says, "Advances in electronic publishing, particularly through the CALS initiative, are on the verge of revolutionizing the process of corporate management." Also, he says, "CALS-compliant systems will lay down the foundation and infrastructure of the management tools necessary for competitive success in the years ahead."

The overall richness of the CALS initiative has begun to attract the likes of IBM, Digital Equipment Corp., AT&T and Unisys Corp., Goodstein points out.

Goodstein further stresses that publishing is the second "invisible" business of every corporation and government office. The cost implications of this are enormous. "As early as 1980, between 6% and 10% of corporate gross revenues were spent moving and creating information on paper," he notes.

The historical solution to corporate publishing has been to build up isolated publishing groups throughout an organization. This has led to decentralization and fragmentation of resources, which is extremely costly.

Desktop publishing solutions drew attention to this situation for the first time when they appeared in the mid-1980s. However, they tended to exacerbate the problem by encouraging even more fragmentation, to the point that even top-paid managers were wasting company time working on what Goodstein and others call "golden memos."

CALS-like publishing will combat this

type of wasted effort, Goodstein contends, by bringing about a fundamental change in attitude. Corporations will come to view documents as information in various stages of a life cycle, subject to revisions and edits. They may also have to accept that corporate electronic publishing is emerging as a mandate for information systems professionals in major organizations worldwide.

## What can IS do?

Barry Schaeffer, principal of the Wellington Consulting Group, a publishing consulting firm in Arlington, Va., says that IS

specialists can be doing a number of things to get ready for CALS in the electronic publishing environment:

- Fully understand what is meant by an automated publishing process, including its links to product design, manufacturing, delivery and ongoing service.
- Recognize that corporate publishing processes reflect information management functions. The effectiveness of the functions will determine the capability limitations of the publishing process, not the reverse.
- Get to know your own corporation's publishing needs. A good way to start is to

examine those documents that support your primary products or services.

- Keep track of evolving information architectures such as IBM's Systems Application Architecture and DEC's Compound Document Architecture, noting how they are affected by CALS.
- Know the basic concepts embodied in the CALS program. Identify its most important standards, then establish them in your corporate networking, interchange and software standards.
- Consider incorporating the key CALS standards in all future electronic publishing procurements. Having a CALS-compliant system now may make it easier for you to integrate the systems and applications that you add to your corporate information environment. •

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Bayne is aerospace market manager and Meehan is manager of technical-publishing products at Xyvision, Inc. in Wakefield, Mass.



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prevtime = TIME(m) - 5
/* PROC SECTION */
IF (TIME(M) - prevtime > 5) | (TIME(M) - prevtime < 0) THEN DO
    prevtime = TIME(M)
    msg. user = 'DISPLAY' /* Done for another Rule */
    RETURN DISPLAY
END
/* Here when an IKJ574I displayed in the last 5 minutes */
msg. user = ''
RETURN SUPPRESS
```

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# COMPUTER INDUSTRY

## INDUSTRY INSIGHT

J. A. Savage

### Foreign affairs



I've heard more computer news from Hitachi than I have pitches from American Ex-

press, cola companies and baseball teams put together in the past month. Hitachi seems to have its international nose in more business than your average uninvited and interfering relative.

The following came in the last week of July:

- Hitachi licenses Hewlett-Packard's reduced instruction set computing (RISC) architecture.
- Hitachi may sell supercomputers through National Advanced Systems.
- Hitachi will use gallium arsenide chips in NAS cache memory.
- Hitachi cross-licenses supercomputer technology with Cray.
- Hitachi withdraws patent infringement suit against Motorola on July 27.
- Hitachi continues patent infringement suit against Motorola on July 31.

All this from a company that is 5,150 miles and a working day away from my Silicon Valley office.

Hitachi is investing in American technology in a big way. For a formerly shy corporation, unsure of the American market, it is forging ahead with American alliances as if its future depended on it. Or perhaps the \$41 billion company has little to lose and the ventures are just one big experiment in Japanese-U.S. relationships.

Hitachi can be a stubborn foe, as in the case of the lawsuit against Motorola that began in January when several years of negotiations broke down and Motorola accused Hitachi of diverting its negotiators to an Illinois hotel room while Hitachi

*Continued on page 84*

#### Inside

- Enigma says it wants to padlock your platform. Page 79.
- Mt. Xinu says it wants growth, but not at any price. Page 80.

## Tiny PCs bud in Silicon sun

BY JAMES DALY  
CW STAFF

In the sprawling high-tech megalopolis of Silicon Valley, thinking small has suddenly become very big.

During the past few months, several major start-ups based in these San Francisco suburbs have flung muscle, material and millions of venture capital dollars into ideas designed to gain control of the diamond mine that is known as the portable personal

computer market.

With Japanese competitors like Toshiba Corp., Zenith Data Systems and NEC Corp. now controlling more than 90% of a rapidly expanding market, the race to provide the smallest, lightest and sleekest has suddenly become hot indeed.

In Mountain View, Calif., Agilis Corp. is offering radio-linked handheld workstations and wireless local-area networks for users on the go. Up the road in Sunnyvale, Calif., stands the

headquarters of Poqet Computer Corp., which boasts a DOS-compatible, 1-lb. computer that offers credit-card-size memory cards.

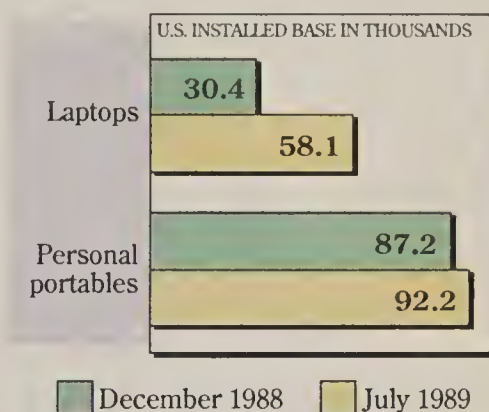
But perhaps the most promising of the diverse cadre of young start-ups is Dynabook Technologies Corp., a San Jose, Calif., firm that has a \$20 million-plus bankroll and shelf space at Computerland stores and is asking for nothing less than the redefinition of the portable marketplace.

"The nature of computing is about to change," President Vinod Khosla boasted. "What we're talking about is a more 'personal' personal computer — a portable desktop computer, if you will."

The Dynabook 286 is an attractively slim black box that packs all the punch of an Intel Corp. 80386-based desktop computer. A detachable pop-up screen can be employed for laptop use, or the CPU/keyboard unit can be plugged into any standard computer monitor. Systems start at \$3,695.

Computer industry trivia buffs may recall that the product's name refers to researcher and Apple Computer, Inc. fellow Alan Kay's visionary concept of a book-size computer capable of performing as a writing and reference tool.

Less is more — and growing  
Tiny computers are generating big sales



SOURCE: COMPUTER INTELLIGENCE CW CHART: FRANK C. O'CONNELL

Although the Dynabook 286 relies primarily on today's technical know-how rather than tomorrow's, Khosla readily admits that "nothing revolutionary gets built out of old technologies."

In deference to that belief, the machine does some groundbreaking of its own. One of its most interesting widgets is the docking module, which latches onto the back of the machine. All connecting cables are in turn plugged into the module. When the office work is done, the module can be unlatched, and the now-portable CPU can be slipped into the nearest briefcase.

But Khosla knows a good product alone doesn't necessarily guarantee success; it helps to be born with a silver spoon in your mouth. So a managerial team was assembled that reads like a who's who of the computer industry: Khosla co-founded Sun Microsystems, Inc.; Chief Exec-

*Continued on page 79*

## Ask snaps up Data 3

MOUNTAIN VIEW, Calif. — Ask Computer Systems, Inc., a \$186 million supplier of manufacturing systems, has acquired Data 3 Systems, Inc., based in Santa Rosa, Calif., for \$19 million. Although the deal is subject to final approval by Data 3 shareholders, the acquisition would combine Data 3's IBM System/38 and Application System/400 manufacturing platforms with Ask's base of Hewlett-Packard Co. and Digital Equipment Corp. systems.

"It seems that Ask is attempting to head off a move by SSA to position itself as the dominant AS/400 third-party supplier," said Keith Belton, director of manufacturing research at The Yankee Group in Boston. Systems Software Associates

(SSA), a Chicago-based \$60 million value-added reseller of IBM midrange systems, leads the manufacturing resource planning industry in market share, Belton said.

Data 3, a privately held firm with \$16 million in revenue last year, has an installed base of 500 IBM System/38 and AS/400 users. Ask, which sells the Man-Man integrated software system for manufacturing environments, has systems installed at 2,400 sites worldwide.

In an unrelated development, Alameda, Calif.-based Relational Technology, Inc. announced last week that Ask had licensed that company's Ingres relational database management system and application development tools for resale to Ask customers.

## 3Com takes strike two with financial fade

*Analyst head-scratching follows announcement of potential fiscal loss*

BY PATRICIA KEEFE  
CW STAFF

SANTA CLARA, Calif. — 3Com Corp. threw Wall Street its second curve in as many quarters last week, announcing the potential for a loss as opposed to reaping the \$100 million in sales that analysts had expected for its first fiscal quarter.

That bomb cost 3Com 4% of a point, tumbling the network supplier's stock to 14½, its lowest ebb in at least the last 12 months, following heavy trading of 6,603,300 shares. Yet a 3Com source described the likelihood of a loss as "slim to none."

Several Wall Street analysts said expectations for the entire year are uncertain, adding that 3Com's credibility has taken a beating following two disappointing quarters. "I don't think the stock will bounce right back

up," said Cecilia Brancato, an analyst with Oppenheimer & Co.

Kidder Peabody in Boston lowered its earning estimate for the year, also downgrading 3Com from a hold to a sell, said Vice-President William Becklean. "Clearly Wall Street is concerned about the fundamental strength of 3Com's business," he added.

3Com, in turn, maintains it had a "damn fine" fourth quarter and sees the first quarter as an aberration. The company will no longer offer financial projections.

At 3Com's annual meeting in June, 3Com President William Krause addressed fallout from the third quarter ended May 31, which while produc-

ing a 12% increase in net income over the same period a year ago, was also less than Wall Street had anticipated.

Krause also told analysts that 3Com expected to reach \$500 million in sales in fiscal 1990, based on sales growth objectives of 30% to 45% and earnings per share growth of about 30%. He sounded a warning about first-quarter income, as well. "We knew [it] would be challenging," he said.

That prophetic statement was right on the money. Last week, 3Com reported lower than expected orders in June and July, predicting the first fiscal quarter results will dip below Wall Street estimates of 22 cents per share.



3Com's Krause sounds warning

3Com hedged its bets, noting "the possibility of a loss cannot be ruled out." Quarterly earnings will rely heavily upon achieving strong sales this month.

In a prepared statement, 3Com said it is too early to determine the impact of the first quarter on previously stated fiscal 1990 objectives.

Last Monday, a contrite Krause held a teleconference with about 50 analysts; he waxed vague on the financial details but spelled out the causes and effects of 3Com's slumping sales.

The factors affecting sales, Krause told analysts, are the following: a downturn in the economy, which has affected buying decisions of large customers; fluctuations in U.S. currency overseas, which led international distributors to cut back on 3Com inventory; slower than expected 3+ Open sales attributed to users choosing to bypass Version 1.0 for Version 1.1; and sluggish adapter sales, both because

*Continued on page 84*





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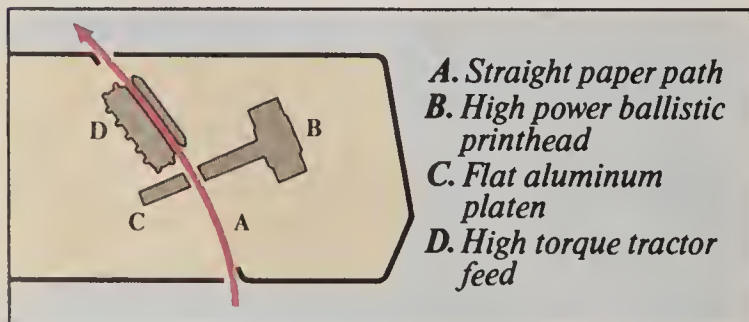
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# Insecure times ripe for Enigma

*Firm rises on tide of concern about data security in wake of virus attack*

BY JEAN S. BOZMAN  
CW STAFF

CONCORD, Calif. — The era of distributed data processing is only in its infancy, but already one downside of enterprise data networks has emerged: Any authorized user can easily export secured data to his personal computer — and walk off with it.

Last November's computer virus attack on hundreds of machines nationwide brought home the need for greater network security, said Joe Hootman, vice-president of marketing at Enigma Logic, Inc., a small software security firm based here. According to Enigma, the challenge is to secure each computing platform, no matter where it is located.

"The whole computer world has been built up for 20 years on the honor system, using fixed passwords on mainframes and minis," Hootman said. "Now, people are beginning to see that today's integrated supersystems require users to secure data flowing through the entire enterprise."

Seven years after its found-

ing, the \$1 million software house's executives believe its time has come.

Recently, large purchases from Fortune 500 firms and the federal government kicked monthly sales past their previous quarterly level. The company is hiring to double its 29-person staff by next year — and is anticipating a doubling in revenue as well.

"We can feel the industry rising under us, and that's what we've been waiting for," said President John Muir. Enigma has six or seven competitors, but none so large that all will not benefit from widespread demand for more secure systems, according to Muir.

Enigma has spent recent years focusing on product development, including software to secure Digital Equipment Corp. VAXs, IBM mainframes, IBM-compatible PCs and fault-tolerant machines from Tandem Computers, Inc. and Stratus

Computers, Inc. Customers include banks, power companies and state and federal government agencies. The Enigma staff is working to extend the security software to several more computer platforms, Muir said.

The key to most of the company's products is having the user respond correctly to an everchanging series of log-on challenges. Individual users are each given a special handheld calculator that has been programmed to respond uniquely to mainframe-generated numbers.



Enigma's  
Hootman

The calculator multiplies a software "key" by the national Data Encryption Standard (DES) to generate a numeric password that cannot be memorized nor anticipated. It

also holds a personal identification number, similar to that used at banks' automated teller machines. Muir said the DES is an exceedingly long algorithm said to have been broken by only one user — the National Security

Administration.

Enigma thinks it can stop hackers — even those using automated log-on attempts such as those shown in the film *War Games* — by continuing to change the numbers in a computer challenge. Repeated log-on attempts are blocked after a given number of failures (usually four) and saved until information systems can view them. If authorized users misuse data, Enigma Logic's log-on devices can track which user device caused the security problem.

Even so, the intention is to create as few obstacles as possible for legitimate users, who may have to log on to multiple systems to get their work done each day.

This month, in response to user interest in repelling computer-virus attacks, Enigma is introducing Safeword Virus-Safe, a \$125 software package that verifies program integrity to determine the presence of new and possibly foreign code.

There are many methods of securing data, Muir and Hootman said. Among them are "biometric" methods such as fingerprint identification and retina-



Enigma's  
Muir

scanning. If a user wants these devices tied into the security software, Enigma will supply the combined system. But such systems are best for controlling physical access to secured sites, such as military computer centers.

For most commercial sites, however, the emergence of global and national data networks challenges IS managers to view the entire enterprisewide network as a single data system.

"This is not computer security; it's data security," Muir said. "We have to analyze where the data is flowing and control it where it is."

Users find the Enigma software helpful, even if they do not have it on every computer platform. "We're just moving into this area," said one West Coast user. "We didn't do anything like data encryption until we had an incident in which someone stole a PC containing restricted information."

The user termed Enigma "a small but sharp company that introduced themselves three years ago." When the security breach occurred, the user called them back for help.

## Silicon

FROM PAGE 77

utive Officer Dan Wilkie was a key manager in developing the IBM Personal Computer; Chief Operating Officer John Lally is a general partner in venture capital firm Kleiner Perkins Caufield and Byers; and Senior Vice-President of Sales and Marketing Mike Shabazian was former president of Computerland U.S.

Nevertheless, Khosla foresees a tough fight: "We need to be not only a superior laptop, but a very competitive desktop."

Some analysts doubt Dynabook can win.

"Dynabook has aimed too closely at Compaq's market," said Richard A. Shaffer, president of New York market research firm Technologic Partners. "Can Dynabook make money? Possibly. Can it succeed in a big way? No, it's too late and too conventional."

However, with a \$6 million initial order from Computerland in his pocket and the next two generations of the machine expected within a year, Khosla feels the firm is hitting its stride.



Dynabook's  
Khosla

## NICKELS & DIMES

**Kaypro Corp.** generated net sales of \$3.8 million and net earnings of \$239,600 for its third quarter ended May 31.

Southboro, Mass.-based **Bytex Corp.** announced \$9.2 million in revenue for the fiscal quarter ended June 30, which represents an 18% increase over second-quarter 1988 revenue of \$7.8 million. Net income of \$711,000 for the second quarter of 1989 increased 182% from \$252,000 reported for the second quarter of 1988.

**Advanced Micro Devices** reported second-quarter revenue of \$274 million and a net profit of \$12 million. Sales declined 11% from the robust second quarter of 1988 when the company reported revenue of \$308 million, with a net profit of \$26 million.

Livermore, Calif.-based **Triad Systems Corp.**, purveyors of computers to specialty markets, reported revenue of \$35 million for the third quarter of fiscal 1989, a 14% increase over the same period the previous year. Expenses relating to Triad's settlement with hostile suitor **Volt Information Sciences, Inc.** and costs associated with preliminary financing arrangements for Triad's proposed recapitalization resulted in a net loss of \$1.3 million.

Reston, Va.-based software vendor **Systems Center, Inc.** reported revenue of \$15.4 million for the second quarter ended June 30, up 23% from \$12.6 million for the same period in 1988. Net income increased to \$1.9 million, compared with \$1.8 million for last year's comparable period.

**Sungard Data Systems, Inc.** announced net income for its second quarter ended June 30, 1989, was \$3.4 million, a 30% increase over net income of \$2.7 million for the quarter ended June 30, 1988. Earnings per share increased 24% to 31 cents from 25 cents in 1988. Revenue for the second quarter of 1989 was \$37.9 million, an increase of 27% over 1988 second-quarter revenue of \$29.9 million.

Dallas-based banking software vendor **Hogan Systems, Inc.** reported net income of \$1 million, or 7 cents per share, on revenue of \$11.2 million for its fiscal quarter ended June 30. For the quarter ended June 30, 1988, Hogan reported a net loss of \$5.9 million, or 45 cents per share, on revenue of \$10.8 million.

**AST Research, Inc.** announced sales of \$123.5 million for the fourth quarter ended June 30 and \$456.5 million for

the 1989 fiscal year. This compares with sales of \$135.7 million for the fourth quarter of 1988 and \$412.7 million for the fiscal year 1988. The company reported a net loss for fiscal year 1989 of \$7.5 million, compared with a profit of \$15.1 million for fiscal 1988.

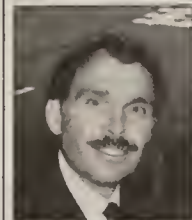
**Information Science, Inc.**, provider of software and services for human resources management systems, reported a profit for its fiscal year ended April 30 of \$107,000 on revenue

of \$13.1 million. This compared with a net loss of \$3.9 million on revenue of \$12.3 million for fiscal 1988.

**Interleaf, Inc.** in Cambridge, Mass., reported earnings of \$126,000, or 1 cent per share, for the first quarter ended June 30, 1989 of its 1990 fiscal year. The company earned \$109,000, or 1 cent per share, for the same period a year ago. Revenue for the quarter increased 32% to \$22.4 million from \$17.1 million for last year's period.

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Schneider

A San Francisco computer utility, a Florida bank and a Silicon Valley chip maker all recently acquired 3090 systems at rock-bottom prices as explained in a free booklet entitled "Building Bargain 3090's." These systems including a 150E, a 200E and a 300S, were not supplied by IBM nor did they come from the usual "third-party" market sources. They were "built" from smaller versions of used 3090 base machines combined with new IBM model upgrades.

"Here's how it works," explained Russell Schneider, President of Marketex, the

California-based company which supplied all three systems. "Let's say a customer is considering a 150S. IBM's new cost is about \$1.7 million. We start with a used 150 or 150E and have IBM add a new 170S upgrade. The total system costs about \$1.5 million. The user gets a new 170S for \$200,000 less than the cost of a 150S." "Everybody wins," Schneider added. "IBM gets the order for the upgrade and they fully support the installation."

For a **free** copy of "Building Bargain 3090's" with the latest prices MIP ratings and upgrade paths, call **(800) 426-4381** (calif: 408-241-3677) or write to: **Marketex, 1601 Civic Center Dr., Santa Clara, CA 95050.**



# Mt. Xinu aims for big firm's bucks, small firm's freedom

BY J. A. SAVAGE  
CW STAFF

BERKELEY, Calif. — Mt. Xinu doesn't want to grow up, it only wants to get bigger — that and develop a few commercial products, perhaps establish a name and make some money. But the management-by-democracy company does not want the spectacular kind of start-up company envisioned by venture capitalists.

Mt. Xinu has a spate of new products

set for release in January. The firm is betting that Mach, a new operating system it is developing under the aegis of Carnegie Mellon University and the Defense Advanced Research Projects Agency (DARPA), will be the operating system that will catapult the company into the future, just as Unix has propelled it through the first six years.

The firm is not alone in the bet; Steve Jobs' high-profile start-up, Next, Inc., bases its workstations on Mach.

It is not the operating system change that is posing the biggest growth problem for Mt. Xinu, but that its employee-owners want to retain the cooperative, horizontal management atmosphere while the company gets bigger and richer.

"The company was founded by a group of technical people from [the University of California at] Berkeley who made a conscious decision not to hire management to exploit their labor," said Bob Kridle, president of Xinu. Kridle describes himself as a "weak manager" who wields no authority by the virtue of being president.

Instead of taking on typical management, the founders learned business skills. "It took six or seven years, but we've learned enough about management in a unique way to put ourselves on the

map," Kridle said.

Mt. Xinu is not run without authority. Each of five divisions within the company has a leader, but that leader can be voted out of the position at any time. "Object-oriented management" is what Alan Tobey, marketing manager at the company, calls it.

The company has been able to keep its nonhierarchical management and consistent growth largely because it exists without the pressure of venture capitalists. Its Unix development tools, aimed at the "technocrazies," as Tobey says, have kept the income incoming, but not at the level expected by venture capitalists in an average start-up.

## Focal point

Thus far, the company has focused on the University of California at Berkeley's Unix development packages for other Unix developers. Now, armed with a distribution grant from Carnegie Mellon (which is coordinating research on Mach) and DARPA, it aims to put out two releases of Mach for development, ported to several hardware platforms in the next two years.

The first ports from Mt. Xinu will be to Digital Equipment Corp.'s Microvax, Sun Microsystems, Inc.'s Sun 3 and IBM's RT workstation, said Deborah Scherrer, a Xinu computer scientist. In addition to the new operating system, which supports multiprocessing and memory management better than Unix, other software will be available for Mach, such as X Win-

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**I**T IS NOT the operating system change that is posing the biggest growth problem for Mt. Xinu, but that its employee-owners want to retain the cooperative, horizontal management atmosphere while the company gets bigger and richer.

dow System, Camelot (transaction processing), Unix 4.3 and the Andrew tool kit and file system, Scherrer said.

Government funding for Mach is increasing, according to Kridle, and whatever the operating system will be used for, Mt. Xinu is poised on the commercial edge. "We work with people who do the 'R' — we do the '&D,'" Tobey said. "We will ride Mach further down the road than Unix."

Mt. Xinu does not know what the "magic" application for Mach will be, but the operating system is more maintainable than Unix, according to Tobey. "In Unix, there are a couple megabytes of code in the kernel. Mach is much smaller and its implemented in a modular way instead of letting the kernel do all the work," he said.

Kridle would like his company to make him a rich man, he says, but not if it forsakes a business atmosphere in which he and his colleagues maintain freedom to explore technology and communal strategizing. "It's taken us a long time to sneak up on a reasonable amount of employees while keeping them involved in decision-making," Kridle said. "But you get a unique amount of dedication when everyone is involved in that decision-making."



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## COMPUTERWORLD

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**Despite 3990 delays,** IBM's high-end storage controller wins early user endorsements. Page 27.

### Court: States may tax net traffic

BY MITCH BETTS  
CW STAFF

WASHINGTON, D.C. — A U.S. Supreme Court ruling last week will allow states to tax interstate voice and data traffic.

With several states having already enacted such taxes and others desperately seeking new sources of revenue, the decision could raise the cost of business communications and affect the location of data centers.

The decision upheld an Illinois law imposing a 5% excise tax on interstate voice and data transmissions that begin or end in the state. Approximately a dozen states have similar taxes, and more states are expected to follow suit.

**Axed with taxes**  
Illinois collected \$142 million in taxes by mid-1987 and continues to collect revenue at a rate of \$10 million per month from business and residential users, according to a court filing.

Business network managers, especially those with high-volume transaction networks such as airline reservation systems, may wind up moving their data centers to "tax haven" states that do not impose telecommunications taxes, according to experts.

"This will definitely affect site-location decisions," said Kenneth L. Phillips, vice-president of telecommunications policy at Citicorp in New York and chairman of the Committee of Continued on page 16

**Revenue enhancers**  
A dozen states already have some form of tax on interstate telecommunications, and more are expected to follow as a result of last week's green light from the U.S. Supreme Court.



**On SQL Server's test trail**  
BY DOUGLAS BARNEY  
CW STAFF

A glaring shortage of front-end development tools and the lack of a finished product has not stopped a handful of the U.S.'s largest corporations from hatching SQL Server applications.

SQL Server, announced one year ago by Ashton-Tate Corp., Microsoft Corp. and Sybase, Inc., is a multiuser database engine designed for the OS/2 operating system.

It implements the so-called client/server architecture, under which a server handles data management while users' workstations provide the interface or front end.

Users who are anxious to get cracking have been forced to buy the \$1,995 Network Development Kit, which is essentially a beta-test version of the software.

Of the 800 units sold, some 200 to 250 have been snapped up by corporations, according to Microsoft SQL Server product manager Dave Kaplan.

System One Airplane Services, a subsidiary of Texas Air Corp., already has a prototype application running under SQL Server, and the results are promising. Curt L. Abraham, Continued on page 6

**NAS deal brings new lineup to plug-compatible market**  
BY JEAN S. BOZMAN  
AND CLINTON WILDER  
CW STAFF

SANTA CLARA, Calif. — Months of uncertainty for users of National Advanced Systems CPUs came to an end last week with National Semiconductor Corp.'s sale of 50% of its mainframe unit to Memorex Telex N.V.

After dozens of rumors about the potential sale, the deal — a total package estimated at between \$300 million and \$350 million — appears to guarantee continuity for customers, at least in the near term. NAS management will stay in place, and no work force reductions are anticipated, a NAS spokeswoman said.

But with Memorex Telex obtaining an option to buy out all of National Semiconductor's stake at an unspecified future date, further changes could occur.

"National obviously is headed in a different direction than they were before, but we're encouraged that they kept half the company," said Richard Lester, vice-president of corporate development at Seattle-based Associated Grocers, Inc., which runs a NAS AS/XL 60 and 90/60. "We've done business with Memorex [for several years], and we're very comfortable with them."

Continued on page 8

**Chip prices drop; PC prices don't**  
BY WILLIAM BRANDEL  
CW STAFF

While several vendors used memory costs as an excuse to hike personal computer prices last year, no one is yet promising to bring them down now that the shortage is over.

According to memory-card product vendors and industry analysts, dynamic random-access memory chips are now increasingly available, and prices are dropping. Prices of 1M-bit chips are projected to plummet more than 50% by year's end.

Already, the volume purchase price of 1M-bit chips has dropped to less than \$20 per chip. When the memory crisis peaked in June, the price hovered at \$50 to \$60. Semiconductor price trackers now project that chip prices will fall below \$10 this year.

But vendors that raised system prices during the dearth — including Apple Computer, Inc. — Continued on page 113

**When the chips come down**  
With availability increasing, the price for 1M-bit memory chips has dropped slightly in recent months and is expected to plummet.

	Current Price	Q1 '89 Projected	Q4 '89 Projected
Now '88	\$3.85	\$3.85	\$3.85
Dec '88	\$3.85	\$3.85	\$3.85
Q1 '89 projected	\$3.50	\$3.50	\$3.50
Q4 '89 projected	\$2.50	\$2.50	\$2.50

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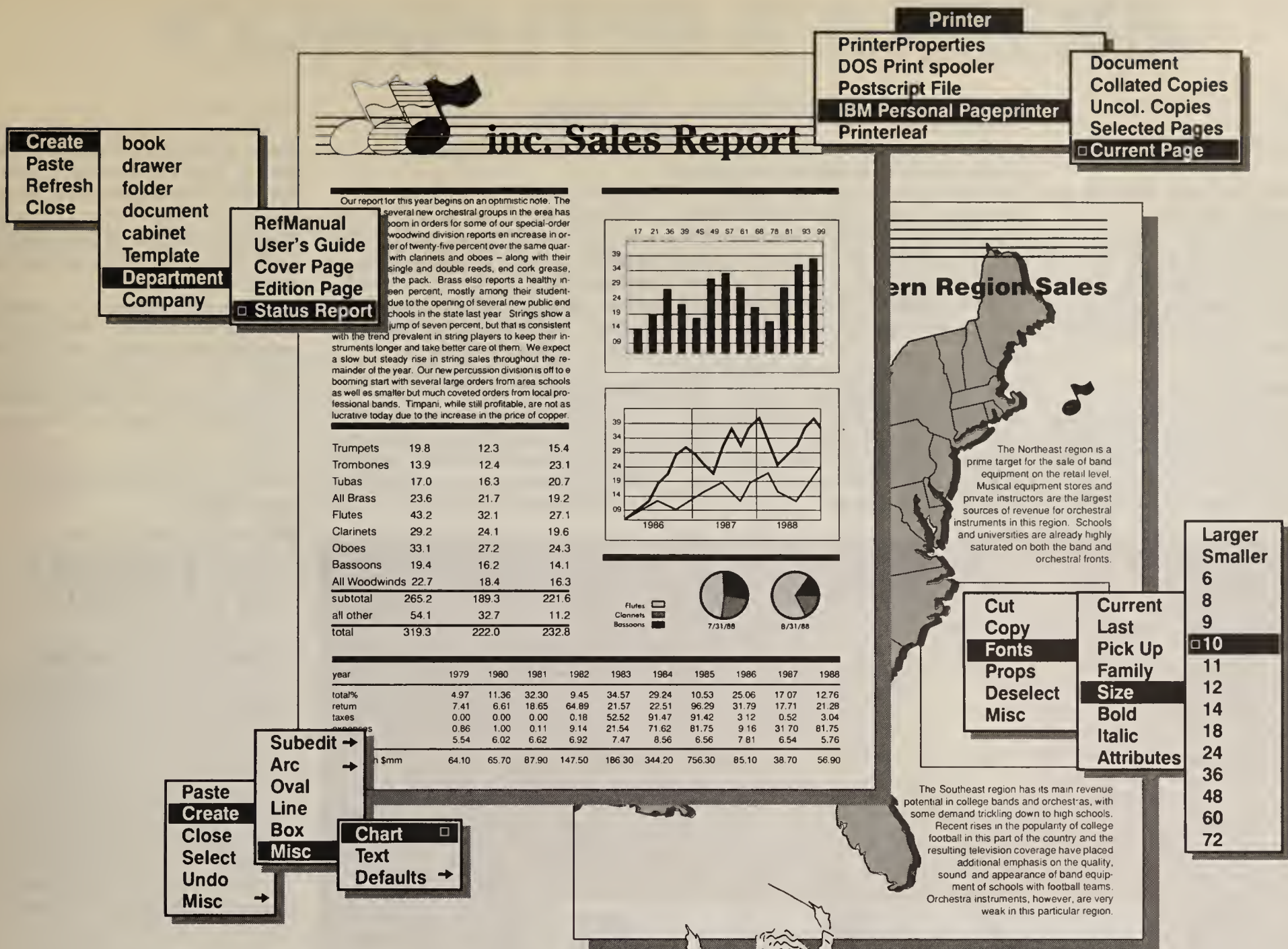
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## 3Com

CONTINUED FROM PAGE 77

of price wars and slow sales of the 3+ Open network software.

Krause disputed the contention of some analysts that the economic slowdown and currency fluctuations are not new phenomena. Analysts cited another negative factor — deteriorating relations with the dealer channel.

### The pressure is on

3Com reportedly has been pressuring dealers to add value to their 3Com sales or risk lowered margins. Rival Novell, Inc. has moved quickly to woo the disgruntled. The end result is that 3Com's inventory

pipeline — both in the U.S. and abroad — is said to be at a trickle.

Krause maintains that 3Com was caught in between product cycles and said that what is needed are some highly differentiated product introductions. 3Com is scheduled to announce Demand Protocol Architecture and 3+ Open 1.1 at the end of this month. A series of new adapter announcements will kick off in the second quarter. Adapter price cuts will be forthcoming.

A wage review and hiring freeze has been instituted. Between 10 and 100 marketing staffers will be moved into field sales, according to 3Com. A \$1 million savings will result from having employees take five days of paid time off in the second quarter, Krause said.

## Savage

CONTINUED FROM PAGE 77

filed the lawsuit.

For the most part, however, Hitachi is as welcome as a rich relative, even if the wealthy relative is that same meddler mentioned above. Its massive research and development staff is acting as an extension of NAS and, more recently, of Hewlett-Packard's RISC team.

### Saving grace

U.S. corporations, which often feel they can ill afford to invest in the future while making their quarterly profits, view the Japanese-style long-term commitment to new technology as a saving grace. And in

NAS' case, it is.

The prying, unwanted-relative part stems mostly from the ubiquitous presence of Hitachi's accountants. Sources describe it as being like living, working and trying to make business decisions in the midst of an Internal Revenue Service audit. Every act must be justified — one doesn't take chances.

The wisdom of having such close relationships with Japanese companies is beside the point. Japanese yen are invested all over the U.S., and Hitachi is only one of the more recent and blatant investors. Just set another plate at the dinner table, please.

Savage is a *Computerworld* West Coast senior correspondent.

## IN BRIEF

### Right back atcha

San Jose, Calif.-based chip maker Atmel Corp. has filed a \$100 million countersuit against Intel Corp., charging the Santa Clara, Calif.-based company with violating anti-trust laws in an effort to corner the market for erasable programmable read-only memory chips. Intel filed a lawsuit against Atmel and several other electronics companies for patent infringement in August 1977.

### Show your stuff

William Cunningham, who formerly headed up worldwide manufacturing operations at Apollo Computer, Inc., was named to the analogous post at Data General Corp. last week. While at Apollo, longtime Honeywell, Inc. veteran Cunningham was also responsible for strategic planning, among other things. According to some industry observers, the best strategic lessons he could bring to embattled DG would be tips on how to get acquired by the likes of Hewlett-Packard Co.

### Slip showing

Novell, Inc. warned that revenue for its third quarter ended July 29, is likely to be down approximately 9% from the second quarter; profits are expected to drop slightly as well. The Provo, Utah-based local-area network vendor cited a strategic shift away from "the nonstrategic hardware business" as primarily responsible for the slide.

### New Interleaf CFO

Several-time computer industry entrepreneur Harry George, who joined in spearheading Kurzweil Computer Products, Inc. and Interleaf, Inc., has resigned from his post as chief financial officer of Interleaf because of a serious heart condition. George, 41, who will remain an Interleaf director, will be replaced by former Prime Computer, Inc. CFO David J. Col-lard.

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# COMPUTER CAREERS

## Automation for the job search

*Software can help identify goals, locate employers and produce resumes*

BY KIM S. NASH  
CW STAFF



Whether it's an advancement, a change in direction or a jump into an entirely new profession, career moves are charged with questions. Personal computer software may furnish some of the answers or at least lead an information systems professional in the right direction. There are programs available that tackle everything from assessing one's skills to preparing for interviews and negotiating a salary.

Sometimes basic questions about career goals are overlooked by "people caught up in the present tense," says Joseph Wiseman, manager of corporate programs at Crystal-Barkley Corp., a career counseling firm in New York. With that thought in mind, the firm developed Career Design, a \$125 package for IBM Personal Computers and compatibles that separates the job seeker's concerns into three groups: "Who Am I?" "What Do I Want?" "How Do I Get There?"

These menu selections generate more than 50 modules that ask the user to respond to a series of questions with a word, sentence or several paragraphs.

The philosophy behind the software is that esoteric exercises in identification of likes, dislikes and personal goals are as important as practical assessments of skills and experiences.

"You can't do an effective job search without organized, sound mechanics, and sound mechanics are a direct product of good self-assessment," says Ed Holton, director of the MBA program at Virginia Polytechnic Institute. He adds that discovering one's inner self may be a problem for IS professionals. "Since IS people frequently come from hard-science, objective, logical backgrounds, it can be particularly difficult for them to make the move to talking about values and emotions when making career plans," Holton says.

Holton believes that career planners will realize greater job satisfaction by dismissing what they think of as practical and following their true interests. "Try to conceptualize the fuzzy areas in your life," he advises, "and don't worry about salary."

Drake Beam Morin, Inc., a career counseling and outplacement company in New York, approaches job hunting with a similar philosophy. Its Career Navigator program, priced at \$129, takes users through a sequence of exercises intended to bring objectives and preferences

into focus before beginning an employment campaign.

Although Career Navigator contains five major menus similarly constructed on the "Know Thyself/Know Thy Career" principle, it offers less opportunity for user interaction than Career Design. Many of its segments simply provide lists of basic tips whose use varies with the user's job market experience. One module, "How To Use The Telephone Effectively," advises the user to be bright and

with no clear picture of an ultimate goal.

Job hunters can apply software to subsequent stages of their efforts, too. Martin Hewett, vice-president of sales and marketing at Essential Software, Inc. in Sherman Oaks, Calif., left a biotechnology company last year and found during his job search that the biggest obstacle was getting organized.

"As a senior executive, you tend to delegate the mechanical processes of letter-writing — keeping files and the like — to other people, and it just gets done," Hewett says. "But when I was doing everything myself, I began to think there weren't enough hours in the day."

**T**HE PHILOSOPHY behind the software is that esoteric exercises in identification of likes, dislikes and personal goals are as important as practical assessments of skills and experiences.

energetic and to be aware of the point he or she wants to convey before placing a call.

Despite their seemingly elementary nature, career-oriented PC packages can be useful, according to Paul Costello, president of Costello and Co., a Westwood, Mass.-based outplacement firm. Costello says he has counseled executives — many of them middle-aged with decades of work experience — who have moved from job to job

People who, like Hewett, need help assembling a contact list and tracking their job-hunting efforts can try software such as Super Job Search from Jamenair Ltd. in Los Angeles. The \$260 program includes databases of executive recruiters, California employers and U.S. employers.

Hewett used the executive recruiters index in conjunction with the package's word processing system to generate a

mass mailing that he says produced four worthwhile offers within six months. "I wish I had used the database sooner because that's what proved to be the major catalyst," he says.

Hewett says the design of the package forces the user to complete every phase — devising a list of contacts, keeping daily notes, laying out a calendar of activities — by way of interlocking ticklers. "It's a structured course that makes sure you get up each morning to see where you are," he says.

Software is also widely available in retail stores for people who know whom to contact and are ready to send out letters and resumes. Among vendors of such programs is Spinnaker Software Corp. in Cambridge, Mass., which makes two programs for IBM PCs and compatibles. Its "Better Working Resume Kit" sells for \$39.95, and "The Easy Working Resume Creator" costs \$9.95. The packages include features such as an on-screen calendar, spelling checking and interview tips.

Robert Rowley, Southwestern regional director at recruiting firm Robert Half International, Inc. in Houston, considered implementing Resume Kit for his staff to use with clients but found it too basic for his needs as a recruiter. However, he adds, the package should be helpful for people who do not have a lot of resume-writing experience.

Nash is a *Computerworld* assistant researcher.



### MVS SYSTEMS PROGRAMMER SAUDI ARABIA

Saudi Consolidated Electric Company in the Eastern Province (SCECO-East) is the largest electric utility company in Saudi Arabia and is one of the fastest growing in the world. At the present time, we have an urgent need for an MVS Systems Programmer with the following minimum qualifications:

- B.S. in Computer Science, a Physical Science, Engineering or Mathematics.
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All positions provide a competitive salary, potential tax free assignment, liberal vacation/travel benefits, married/single status, housing supplement, plus other benefits. Please forward resume to Technical Resources, Inc., 3250 Wilshire Boulevard, Suite S-391, Los Angeles, CA 90010.

**TRI**

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First American Data Services is the Data Processing service subsidiary for First American Banks. The processing center is a state of the art facility located in Reston, Virginia. We operate using an IBM 3090/400E running under VM/MVS/XA. We seek Project Leaders and Programmer/Analysts to assist in conversions and on-going support of IBM's CPCS check processing system and Computer Associates Profitability System. We also seek several programmers experienced in the use of ADABAS and Natural 2. If you meet the qualifications listed below, please send your resume to:

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Attention: Human Resources

**CPCS Project Leader** - A minimum of three years experience as a project leader responsible for the installation and support of CPCS and related support products in a multibank or service bureau environment. MVS/XA experience is a must. A BA or BS degree is required. Will be responsible for a major conversion to CPCS in a multibank environment.

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Requires 3 years experience as Systems Manager in a large TANDEM/VLX shop. CDF experience as well as Panoramic and Control experience would be helpful. The candidate will be responsible for software installs and sysgens, as well as performance tuning. The applicant must be familiar with 3270/SNA and be able to perform network generations. Experience in Pathway configuration and tuning is also necessary.

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We are looking for 3 years of experience in the area of IBM's DB2 relational Data Base Management product. This position will provide DB2 systems support for our multi-data center environment. A strength in DB2 problem determination and resolution is required. Additional knowledge of DB2 internals and installation activities is a plus. Experience in IMS or CICS DB2 attachment is also required.

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Requires 5-7 years experience in IMS development, system generation, support, problem resolution, and performance monitoring and tuning. DB2 and CICS experience also desired along with familiarity with associated program products. Excellent communication skills are important.

We offer a competitive compensation and excellent benefit package which includes medical, dental and life insurance as well as a 401(k) plan and stock purchase program. For prompt and confidential consideration, forward resume and salary history to: **United Data Services, Inc., Human Resources, Dept. JMSP, P.O. Box 7927, Overland Park, Ks. 66207.**

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You will be responsible for supporting the development and maintenance of engineering/manufacturing interface applications; and defining, coordinating and implementing large complex projects. To qualify, you need a Bachelor's degree in Computer Science, Math, or Business; a minimum of 4 years' programming and analysis experience; comprehensive knowledge of COBOL, ADS/O; and a working knowledge of system analysis and IDMS database design.

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Annual salary will be \$52,000/year for a 40-hour work week. Additional salary up to \$55,000/year may be paid if education and experience warrant.

Interested applicants apply at the Texas Employment Commission, Fort Worth, Texas, or send resume to the Texas Employment Commission, Austin, TX 78778-0001, J.O. Number 5515395. This advertisement was paid by an equal opportunity employer.

Programmer Analyst needed by company in Boulder, Colorado which produces business seminars. Design, develop, implement, and test software related to financial systems, using Speed II (a 4GL DBMS). Maintenance and modification of packaged financial software (TOM's A/P, F/A, G/L, and I/C). Assess user needs and train users on new software. Troubleshoot software problems and provide system administration. Requires B.S. in Mathematics or Computer Science and one year experience with Speed II programming on Wang VS. Also requires working knowledge of TOM's Software Accounting Packages. \$26,085/year; 8:00 a.m. - 5:00 p.m., M-F. Respond by resume to Colorado Department of Labor & Employment, Division of Employment & Training, 600 Grant Street, Suite 900, Denver, CO 80203. ATT: Phil Minjarez, and refer to Job Order No. CO3052658.

Wanted: Applications Software Engineer. Duties include: Design, develop and implement software solutions related to CAD/CAM/CAE applications in Mechanical Engineering. Develop p-version FEM/FEA processors using Interactive Computer Graphics and Engineering Optimization on workstations. Create tools for the design of machine elements using 3D geometrical and surface modeling techniques. Develop and initiate methods and procedures for software testing, evaluation and documentation. Interact effectively with customers and resolve engineering problems. Required: Master of Science in Mechanical Engineering. College level coursework in CAD/CAM/CAE applications and computer graphics including 3D geometrical and surface modeling techniques. Employment in Minneapolis, MN area. 40hrs/wk. Salary \$30,000 per yr. Reply with resume to: Mr. R. Tibbets, #9-108, MDJT, 390 No. Robert St., St. Paul, MN 55101

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Mayo Clinic in Rochester, MN, is a dynamic community of 62,000 located approximately 75 miles southeast of Minneapolis/St. Paul. Mayo, with a staff of over 14,000 employees is a leader in health care, education and research. With 900 physicians on staff and more than 1800 beds in 2 large Rochester hospitals, the Mayo Medical Center is one of the world's largest private medical complexes. In addition to a stimulating and exciting work environment, Mayo provides an attractive compensation package including an outstanding personal security and benefits program. Interview and relocation expenses are provided. Contacts will be kept in strict confidence. Interested and qualified candidates should send resume including salary requirements, available transcripts and credentials to:



Michael Schryver  
Personnel Section  
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Requires 3+ years data base administration experience in an IBM environment and demonstrated experience in analysis, design, and implementation of DLI data bases. Knowledge of DB2, CICS, and IBM Data Dictionary desired.

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With your proven experience in database applications, you'll conduct leading edge research into distributed databases and client-server architectures. Qualify with a BSCS, BSCE, BSEE or a related degree along with four or more years' experience. Programming proficiency in 'C', Assembly and COBOL languages in MS-DOS or OS/2, and VM/VMS environments is essential. LAN and communications experience, such as SNA/SDLC and X.25, is preferred. In addition, you should have experience in relational databases such as ORACLE, DB2, RTI or SQL SERVER.

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- Proven experience in design, performance and tuning of IMS databases
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  - Experience with DB2 table maintenance a plus

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- Requires 2-3 years IMS systems programming experience with:
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CICS SYSTEMS PROGRAMMER

- Requires 1-2 years experience as a CICS Systems Programmer, including:
- Experience in CICS programming, dump debugging, SMPE maintenance and system administration
  - Knowledge of MVS/ESA concepts and CICS internals (1.6 or higher)
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TYBRIN Corporation, an equal opportunity employer, is seeking experienced talent in the engineering and computer sciences fields for our expanding Fort Walton Beach, Florida facilities. College degrees in the computer, engineering, or other closely related physical sciences are firm requirements, i.e., no equivalent in acceptable.

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**Applications:** All eligible and interested candidates are encouraged to apply at the Personnel Office, Cal Poly, San Luis Obispo, CA 93407, (805) 756-2236. An official completed Cal Poly application form must be postmarked or received in the Personnel Office by 5 pm of the closing date. Cal Poly hires only individuals lawfully authorized to work in the U.S. AA / EOE / Rehabilitation Act of 1973 Employer

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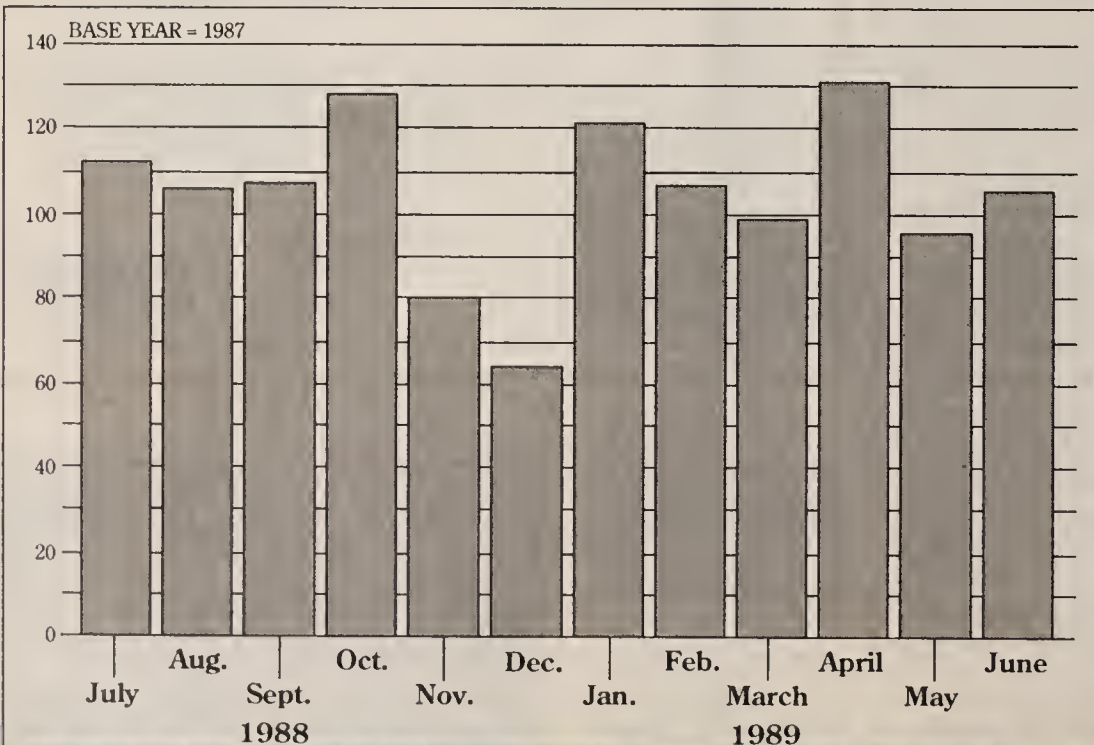
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# CAREER INDEX

## Computer recruitment advertising index\*



\*Analysis of computer recruitment advertising space in Computerworld and selected major U.S. newspapers

SOURCE: CW PUBLISHING, INC.'S RECRUITMENT MARKET RESEARCH DATABASE

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  - 31. Dir., Mgr., Suprv., of Programming
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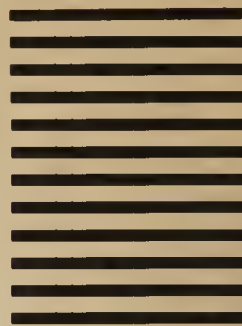
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  - 31. Dir., Mgr., Suprv., of Programming
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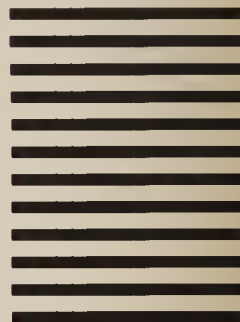
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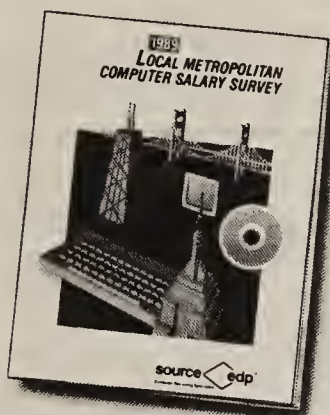
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# MARKETPLACE

## Chip and board prices level off

Users face the DRAM-atic truth that the era of cheap chips won't return

BY LAURA O'CONNELL  
CW STAFF

If you are holding your breath waiting for prices of add-in personal computer memory boards to tumble back to the levels of several years ago, you may want to let it out.

The cost of dynamic random-access memory (DRAM) chips has dropped since a shortage of the semiconductors peaked last summer, and prices of add-in memory boards have followed them down. Chip and board prices remain above their pre-shortage lows, however, and analysts and vendors expect them to level off.

"The chip mania is over," says Alex Randall, president of the Boston Computer Exchange. "We don't see the flurry of phone calls from buyers and sellers trying to negotiate. Prices have stabilized or are falling, and that generally reduces the price of add-in components."

A 384K-byte upgrade board now runs in the range of \$150 to \$200, less than half its price during the heyday of the chip crisis, Randall estimates.

At times last year, board maker Boca Research, Inc. in Boca Raton, Fla., received less than one-third of the chips it was

promised, but the firm now receives an adequate supply, according to Silvia Fagiani, a company spokesman. "The prices aren't back to where they used to be, but they're a lot better than they were," she says.

Boca Research has lowered memory prices every month since January. It cut prices of boards for IBM's Personal Computer and Personal System/2 by 13% to 15% in May. The price of a 4M-byte version of the vendor's Boca RAM/AT, a board for Intel Corp. 80286 and 80386 AT bus machines, dropped \$300 to \$1,995. The company says it plans more price cuts this week.

### DRAM wars

The cheap memory common in 1985 resulted from an "all-out war" among DRAM manufacturers, a situation that is not likely to recur, says Drew Peck, a semiconductor industry analyst with Donaldson, Lufkin & Jenrette, Inc., a securities firm based in New York.

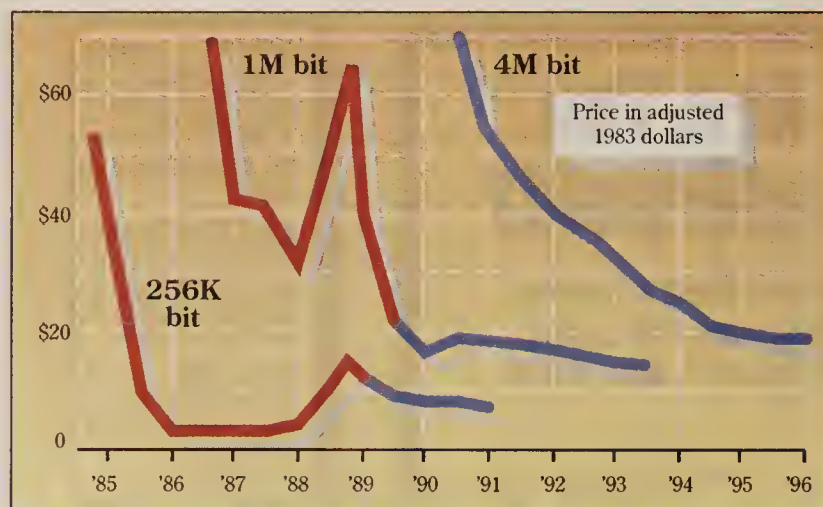
"Users are going to have to get used to paying more for memory than they have in the past," Peck says.

Analysts and vendors cite several reasons why memory prices rose and now will stabilize near their current levels. One is

political: Japanese companies hold a virtual monopoly on DRAM chips, controlling more than 80% of the market. In response to what the U.S. alleged

### DRAM dynamics

As successive generations of DRAM chips enter the picture, prices are expected to follow learning-curve economics but stabilize above previous generations' levels



SOURCE: DONALDSON, LUFKIN AND JENRETTE, INC.

CW CHART: TOM MONAHAN

was Japan's illegal dumping of DRAM chips on the American market, the Reagan administration three years ago negotiated price floors with the Japanese chip makers. The intent was to boost the domestic market share of U.S. DRAM manufacturers, but the agreement prompted lackluster response from the

American producers. Since then, the Japanese have been reaping greater revenues from elevated prices in the face of little new U.S. competition.

The principal cause of the chip crisis was the gap in supplies created as manufacturers converted facilities to produce 1M-bit chips and neglected the ongoing demand for the previous

Memories, Inc., which will produce 4M-bit DRAM chips.

However, widespread use of the 4M-bit chip is at least two years away, according to Peck. Furthermore, he expects the decline in the price per bit of memory accompanying adoption of the 4M-bit chip to be slight compared with the declines accompanying moves to the 256K- and 1M-bit chips.

Before the 4M-bit version goes into mass production, memory demands from the PC sector could put heavy pressure on DRAM supply, Donaldson, Lufkin & Jenrette predicts. Popular applications such as Microsoft Corp.'s Excel and Lotus Development Corp.'s 1-2-3 Release 3.0, both of which require enormous amounts of memory, will drive demand for expansion products.

O'Connell is graphics researcher at Computerworld.

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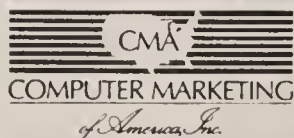
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XT Model 089	\$1,025	\$1,400	\$950
AT Model 099	\$1,625	\$1,850	\$1,400
AT Model 239	\$1,800	\$2,100	\$1,700
AT Model 339	\$1,825	\$2,000	\$1,700
PS/2 Model 50	\$1,750	\$2,000	\$1,700
PS/2 Model 60	\$3,000	\$3,300	\$2,500
Compaq Portable I	\$475	\$750	\$325
Portable II	\$1,700	\$2,100	\$1,700
Portable III	\$2,875	\$2,950	\$2,200
Portable 286	\$1,750	\$2,000	\$1,675
Plus	\$900	\$1,200	\$900
Deskpro 286	\$1,950	\$2,350	\$1,700
Deskpro 386	\$2,750	\$2,900	\$2,500
Apple Macintosh 512	\$600	\$650	\$300
512E	\$675	\$925	\$600
Plus	\$1,000	\$1,150	\$750
II	\$3,250	\$4,175	\$2,500
Zenith 183	\$1,350	\$1,400	\$1,175
Apple IIGS dual floppy	\$1,400	\$1,575	\$1,175

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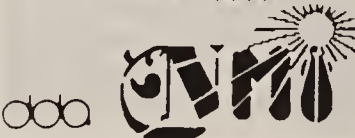
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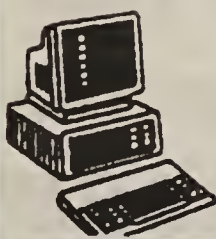
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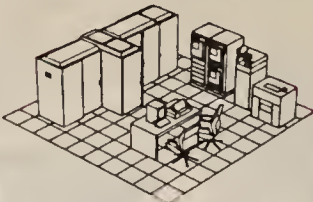
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TO ALL PERSONS ASSERTING A CLAIM  
AGAINST THE ABOVE REFERENCE DEBTOR:

PLEASE TAKE NOTICE, that the United States Bankruptcy Court for the Northern District of New York has entered an order requiring all persons who assert a claim against the Debtor arising, with respect to such Debtor, prior to March 31, 1989 whether such claim is fixed, liquidated, unliquidated, contingent or disputed, to file a proof of claim in accordance with the instruction set forth below with the Clerk of the United States Bankruptcy Court, Northern District of New York, 10 Broad Street, 230 United States Courthouse, Utica, New York 13503, ON OR BEFORE NOVEMBER 1, 1989.

ANY CLAIM FILED AFTER NOVEMBER 1, 1989 WILL BE DISALLOWED. ANY PERSON OR ENTITY THAT IS REQUIRED TO FILE A CLAIM ON OR BEFORE NOVEMBER 1, 1989 AND THAT FAILS TO DO SO WILL NOT BE TREATED AS A CREDITOR FOR PURPOSE OF VOTING OR DISTRIBUTION, AND ANY CLAIM OF SUCH PERSON OR ENTITY WILL BE FOREVER BARRED. FURTHER, ALL CREDITORS LISTED BY THE DEBTOR ON ITS SCHEDULES ORIGINALLY ENTERED BY THE COURT CLERK ON APRIL 4, 1988 ARE FOUND BY THE AUGUST 1, 1989 CLAIMS BAR DATE ORIGINALLY ESTABLISHED HEREIN. THE DEBTOR AND CREDITORS COMMITTEE ARE RESERVED THE RIGHT TO CHALLENGE ANY AND ALL CLAIMS ON ANY AND ALL AVAILABLE GROUNDS INCLUDING THAT A PARTICULAR CLAIM WAS NOT TIMELY FILED.

Exceptions: Persons who assert claims solely as sureties or guarantors must file a proof of claim as required herein on or before December 1, 1989. Persons who assert claims solely be reason of recovery by the Debtor's estate of an executory contract or unexpired lease, the avoidance of a transfer of a tax claim pursuant to Bankruptcy Code Sections 502(g), (h) and (i) shall file a proof of claim on or before the later of December 1, 1989 or 30 days after an order is entered under Bankruptcy Code Sections 502(g), (h) or (i).

A creditor may, for cause shown, apply to the Court prior to the expiration of the bar date for an order extending the bar as to such creditor. Any such application must be on three days prior written notice to the attorneys for the Debtor.

ALL PERSONS WHO FAIL TO FILE A PROOF OF CLAIM IN ACCORDANCE WITH THE COURT'S ORDER SHALL BE FOREVER BARRED FROM ASSERTING A CLAIM AGAINST THE BANKRUPTCY ESTATE OF ICS CYBERNETICS, INC.

Proofs of claim should be filed in conformity with Official Form 15 to the Bankruptcy Rules of Procedure with: Clerk, United States Bankruptcy Court, Northern District of New York, 10 Broad Street, 230 United States Courthouse, Utica, New York 13503, ON OR BEFORE NOVEMBER 1, 1989.

Further information may be had from the Debtor's attorneys or the Creditors Committee at the addresses listed below.

DATED: Buffalo, New York, July 20, 1989

BY ORDER OF THE COURT  
STEPHEN N. GERLING  
UNITED STATES BANKRUPTCY JUDGE

HODGSON, RUSS, ANDREWS, WOODS &  
GOODYEAR, (Garry M. Graber)  
Attorneys for Official Committee  
of Creditors Holding Unsecured Claims  
1800 One M&T Plaza, Buffalo, New York 14203  
(716) 856-4000

GRASS BLANOFF COSTA & WHITELAW P.C.  
(Mary Lannon Fangio)  
Attorneys for Debtor, 247-259 West Fayette St  
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**Request for Proposal No. 1636**, due Thursday, August 24, 1989 at 3:30 p.m. for the acquisition of upgrades to an existing IBM System/36 computer for the UNIVERSITY OF MISSISSIPPI MEDICAL CENTER.

**Request for Proposal No. 1637**, due Tuesday, August 29, 1989 at 3:30 p.m. for the sale of an IBM System/36 model 5360-024 by JONES COUNTY JUNIOR COLLEGE.

**Request for Proposal No. 1638**, due Friday, September 1, 1989 at 3:30 p.m. for the acquisition of a PC-based desktop publishing local area network with related peripherals and software for the Public Relations Department at HINDS COMMUNITY COLLEGE.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

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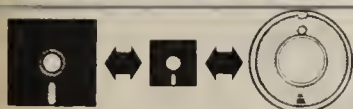
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# TRAINING

## Training? Maybe, maybe not

*Before beginning training, determine if it is the appropriate solution*

BY EDWARD W. SCHNEIDER  
SPECIAL TO CW

Trainers have a lot in common with dentists — both provide services that are necessary but that most people prefer to avoid.

If you are hiring new people or launching a new product, training is inevitable. If you are trying to solve an existing performance problem, however, the best approach is to first rule out every nontraining solution.

Do not initiate training; make the training department do so. After all, when your dentist tells you all four wisdom teeth have to come out, do you say, "Sure, Doc, anything you say," or do you ask why all four should go when only one tooth is throbbing?

There are two kinds of training professionals. Type A measures his productivity by the number of courses he produces or delivers. Type B measures his productivity by the performance of his clients or students. By questioning whether training is the solution to your problem, you will attract the Type B train-

ers. Type A trainers do not want to talk to you until you "know what you want" — that is, until you can write out the course objectives. You'll recognize Type Bs by such embarrassing questions as these: "Have you ever seen anybody do this job right? If we solve this problem, what will it be worth to the company's bottom line?"

Do not be put off by this attitude. This is how Type B trainers make sure your problem has real meat on its bones. If you don't have all the answers, that's all right. Just say, "Let's do a bit of needs analysis."

Needs analysis, sometimes called front-end analysis, is a method of defining and measuring the gap between what is actually happening and what is supposed to happen. Even if it costs some money, it is worth it.

Needs can be measured in a variety of units. Roger Kaufman, a professor at Florida State University has broken them down in the following manner:

- **Inputs** — raw materials, workstations and staffing.
- **Processes** — methods, pro-

cedures and techniques.

- **Products** — production units that have been processed or completed.

- **Outputs** — products delivered to outside customers.

- **Outcomes** — the impact the organization has on society.

When needs get sorted out in this way, it is easier to see where

**N**EEDS ANALYSIS, sometimes called front-end analysis, is a method of defining and measuring the gap between what is actually happening and what is supposed to happen. Even if it costs some money, it's worth it.

the problems lie, how critical they are and who "owns" them. A needs analysis can help you avoid using training to solve some of the following input and process problems:

- Training the people dealing with a problem rather than the ones causing it; sometimes companies try to solve problems downstream from where they originate.

- Training people who know the job but have scant facilities.
- Training people who know the job but have few incentives.
- Training the right people to do ineffective procedures.
- Training people to do more than they have time to do.
- Training people who do not have the basic skills assumed by the training program or the job.
- Training people who have no incentive to learn.

Needs analysis can sometimes show when some of the following alternatives to training

- Providing frequent and systematic feedback to individual workers.

- Identifying exemplary performers and publicizing their tricks of the trade.

- Redefining some organizational roles and responsibilities to improve responsiveness and reduce required resources.

Your training department can help with all of these techniques, thus limiting development of training to the situations in which it is really needed.

There is another benefit to front-end analysis. Training materials that are developed based on a full needs analysis, with thorough field-testing, tend to contain some of the following characteristics:

- Focus in concentrating on the problem or job at hand.
- Power in providing tools that make the job easy.
- Effectiveness in facilitating the transfer of skills from course to job.
- Unity in stemming from a consistent point of view.

If this does not sound like your training program, take heart. By applying these principles, you can start tightening up the ship.

Schneider is proprietor of Peacham Pedagogics in Madison, N.J.

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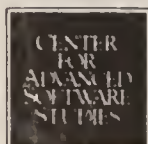
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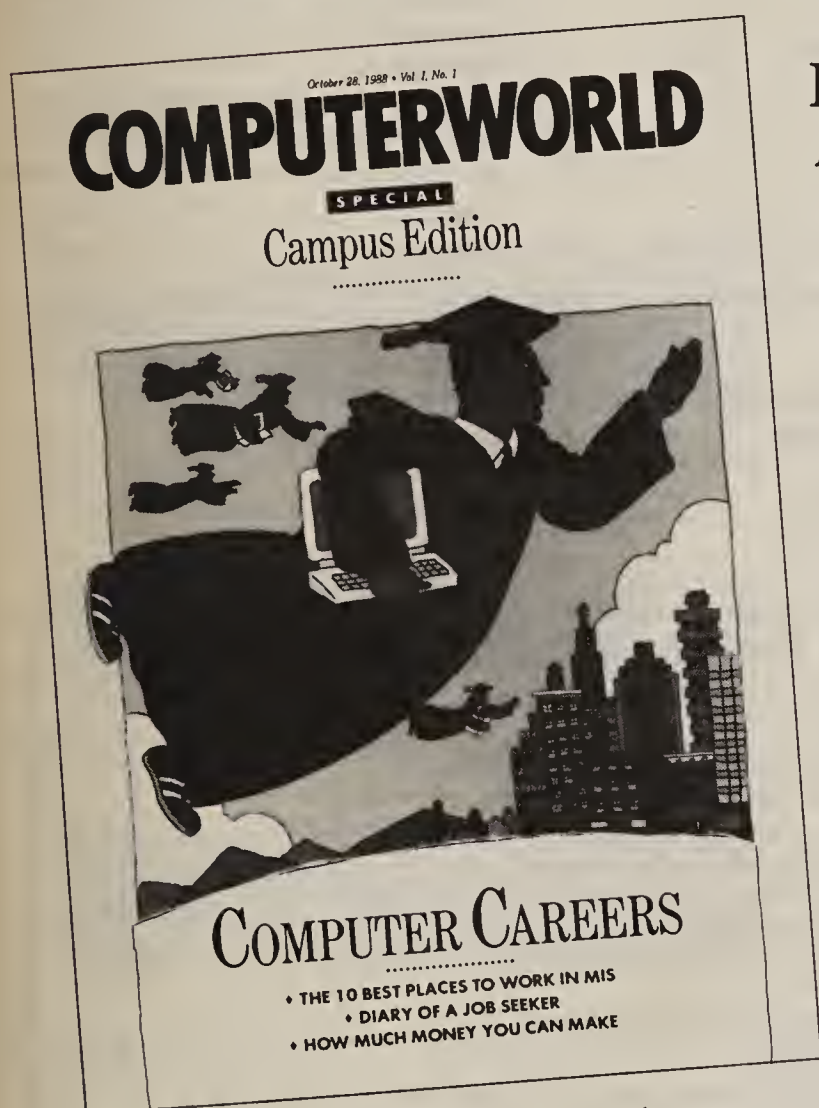


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(subject to revision)



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- Where are the best jobs?/What positions are hot?
- Experiences of recent MIS graduates in their first jobs and what helped them in school
- The MIS career ladder
- Profiles of acclaimed top level MIS executives
- The strategic advantage of computers and how they play a key role in running a company



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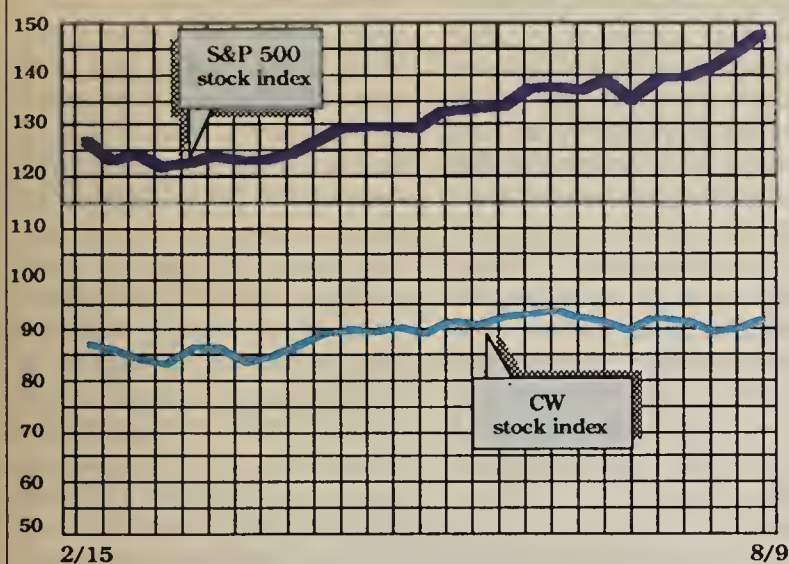
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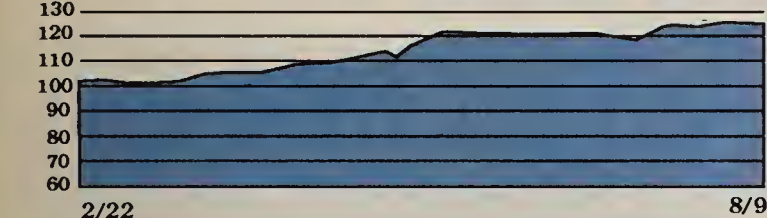


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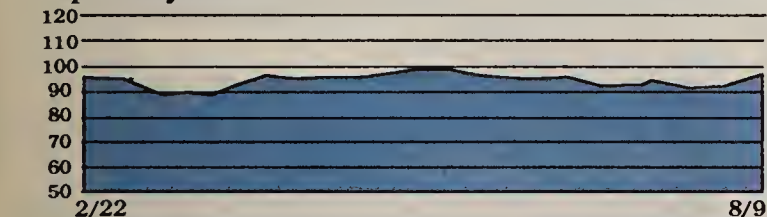


Indexes	Last Week	This Week
Communications	126.9	126.5
Computer Systems	92.2	97.1
Software & DP Services	110.0	112.8
Semiconductors	55.4	57.0
Peripherals & Subsystems	80.2	81.1
Leasing Companies	119.2	116.5
Composite Index	89.9	91.3
S&P 500 Index	144.9	147.3

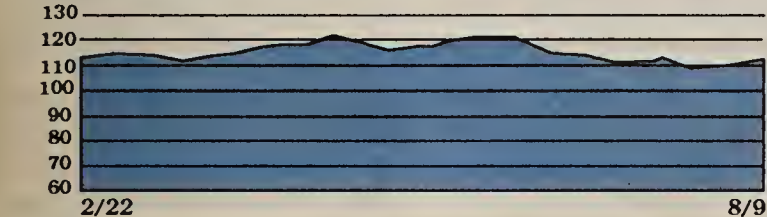
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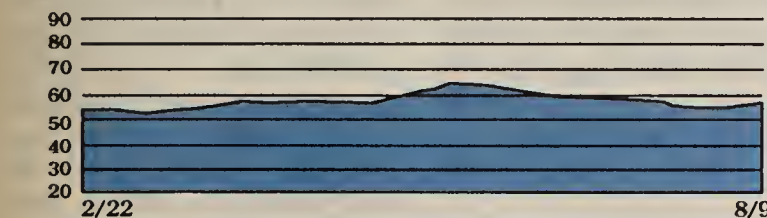
## Computer Systems



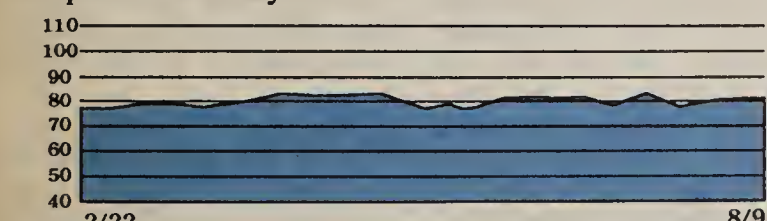
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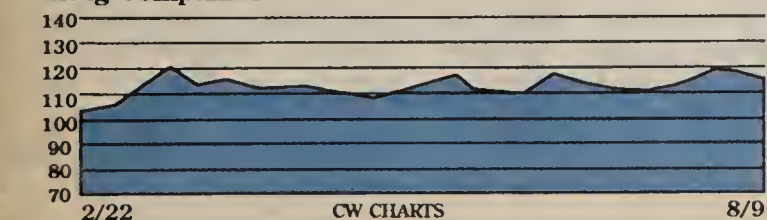
## Semiconductors



## Peripherals & Subsystems



## Leasing Companies



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CLOSING PRICES WEDNESDAY, AUG. 9, 1989

EXCH	52-WEEK RANGE	PRICE	WEEK NET CHNGE	WEEK PCT CHNGE
		AUG. 9, 1989		

## Communications and Network Services

N	AMERICAN INFO TECHS CORP	63 44	59.25	-2.8	-4.4
Q	ANDREW CORP	26 16	23.25	-0.5	-2.1
Q	ARTEL COMM CORP	8 2	6.875	-0.1	-1.8
N	AT&T	61 24	40.125	0.0	0.0
N	AVANTEK INC	7 4	5.875	0.3	4.4
N	AYDIN CORP	19 13	17.375	0.1	0.7
N	BELL ATLANTIC CORP	100 68	97	0.4	0.4
N	BELLSOUTH CORP	54 39	52	-0.9	-1.7
Q	COMPRESSION LABS INC	9 3	8.625	0.5	6.2
Q	COMPUTER NETWORK TECH	3 1	2.751	0.1	2.3
Q	CONTEL CORP	66 34	61.75	-1.0	-1.6
Q	DATA SWITCH CORP	7 4	3.875	-0.3	-6.1
Q	DIGITAL COMM ASSOC	31 17	20.875	-0.3	-1.2
Q	DYNATECH CORP	22 17	18.75	1.5	8.7
Q	FIBRONICS INTERNATIONAL INC	7 3	5.75	-1.5	-20.7
Q	GANDOLF TECHNOLOGIES	7 4	6.625	0.5	8.2
N	GENERAL DATACOMM INDS	6 3	5.375	0.5	10.3
N	GTE CORP	61 40	59.5	-0.3	-0.4
N	INFOTRON SYS CORP	13 10	10	-0.3	-2.4
N	ITT CORP	63 46	61.375	0.0	0.0
N	M A COM INC	10 7	7.375	-0.1	-1.7
Q	MCI COMMUNICATIONS CORP	42 16	37	-1.4	-3.6
N	NETWORK EQUIPMENT TECH INC	25 14	24.875	0.9	3.6
Q	NETWORK SYS CORP	12 8	9.125	0.3	2.8
Q	NORTHERN TELECOM LTD	21 14	20.25	0.4	1.9
N	NOVELL INC	38 24	28.875	0.8	2.7
N	NYNEX CORP	84 63	79.625	0.3	0.3
N	PACIFIC TELESIS GROUP	45 28	43.125	-1.3	-2.8
A	PENRIL CORP	6 3	6	0.4	6.7
N	PLESSEY PLC	46 25	44.5	-0.5	-1.1
N	SCIENTIFIC ATLANTA INC	21 10	19.875	0.9	4.6
N	SOUTHWESTERN BELL CORP	58 36	56.125	-1.0	-1.8
Q	3 COM CORP	29 13	14	-1.0	-17.6
N	U S WEST INC	74 53	72	-1.5	-2.0

## Computer Systems

Q	ALLIANT COMPUTER SYS	6 3	5	0.3	5.3
Q	ALPHA MICROSYSTEMS	8 5	7.375	0.3	3.5
Q	ALTOS COMPUTER SYS	10 6	6.25	0.4	6.4
A	AMDAHL CORP	23 14	15	0.5	3.4
Q	APPLE COMPUTER INC	50 34	44	3.5	8.6
N	BOLT BERANEK & NEWMAN	17 7	8.25	0.8	10.0
N	COMPAQ COMPUTER CORP	102 50	97.25	8.3	9.3
N	COMMODORE INTNL	20 9	10.5	0.0	0.0
Q	COMPUTER AUTOMATION INC	7 3	2.875	0.0	0.0
N	CONTROL DATA CORP	24 16	19.875	-0.5	-2.5
Q	CONVEY COMPUTER CORP	15 7	14.25	0.0	0.0
N	CRAY RESH INC	81 41	45.25	1.1	2.5
Q	DAISY SYS CORP	9 3	4.125	-0.1	-2.9
N	DATA GEN CORP	21 14	16.75	-0.3	-1.5
N	DATAPoint CORP	6 3	5.125	0.0	0.0
Q	DELL COMPUTER CORP	13 6	7.375	0.5	7.3
N	DIGITAL EQUIP CORP	122 86	102	8.3	8.8
N	FLOATING POINT SYS INC	4 2	2.5	0.0	0.0
N	HARRIS CORP	35 25	34.125	-0.4	-1.1
N	HEWLETT PACKARD CO	62 44	56.5	3.8	7.1
N	HONEYWELL INC	92 57	90.875	1.0	1.1
N	IBM	131 106	117.125	3.1	2.7
Q	INFORMATION INTL INC	16 13	15.625	0.4	2.5
Q	IPL SYS INC	9 2	7.875	0.3	3.3
N	MAI BASIC FOUR INC	20 5	5.625	0.6	12.5
N	MATSUSHITA ELEC INDL LTD	207 158	171	-0.9	-0.5
Q	MENTOR GRAPHICS CORP	45 23	36.375	1.9	5.4
N	NBI INC	4 1	2.125	0.1	6.3
N	NCR CORP	65 51	63.75	4.0	6.7
N	PRIME COMPUTER INC	21 12	17.875	0.8	4.4
Q	PYRAMID TECHNOLOGY	20 9	13.75	1.8	14.6
Q	SHAREBASE CORP	4 2	2.313	0.0	0.0
Q	SILICON GRAPHICS CORP	21 14	20	1.1	6.0
Q	STRATUS COMPUTER	35 21	31.25	2.5	8.7
Q	SUN MICROSYSTEM INC	23 13	15.125	1.5	11.0
Q	SYMBOLICS INC	3 1	1.813	0.1	3.6
Q	SEQUENT COMPUTER SYS INC	29 14	28.5	2.1	8.1
N	TANDEM COMPUTERS INC	24 12	23.375	3.0	14.7
N	TANDY CORP	49 38	47.375	1.8	3.8
N	ULTIMATE CORP	13 7	9.625	1.4	16.7
N	UNISYS CORP	34 20	21.75	-0.1	-0.6
A	WANG LABS INC	11 5	7.25	1.5	26.1

## Software & DP Services

Q	ADVANCED COMPTech	4 1	1.063	0.1	6.3
Q	AMERICAN MGMT SYS INC	19 11	12.625	-0.3	-1.9
Q	AMERICAN SOFTWARE INC	18 9	17.125	1.5	9.6
N	ANACOMP INC	10 5	6.375	0.4	6.3
Q	ANALYSTS INTL CORP	22 8	22	0.8	3.5
Q	ASHTON TATE	28 14	14	-1.3	-8.2
Q	ASK COMPUTER SYS INC	18 11	12.5	0.0	0.0
Q	AUTODESK INC	41 23	40.25	3.5	9.5
N	AUTO DATA PROCESSING	43 35	42.625	1.6	4.0
Q	BMC SOFTWARE INC	24 8	22.625	1.0	4.6
Q	BOOLE & BABBAGE INC	20 9	13.75	0.3	1.9
N	BUSINESSLAND INC	15 10	12.375	1.0	8.8
N	COMPUTER ASSOC INTERNATIONAL INC	22 12	19.375	1.4	7.6
Q	COMPUTER HORIZONS CORP	12 7	7.25	-0.3	-3.3
N	COMPUTER SCIENCES CORP	56 44	52.625	0.4	0.7
Q	CORPORATE SOFTWARE	16 9	13.75	1.0	7.8
N	COMPUTER TASK GROUP INC	17 11	12.75	-1.0	-7.3
Q	COGNOS INC	9 5	6	-0.1	-2.0
Q	COMSHARE INC	35 18	32.25	1.5	4.9
N	CULLINET SOFTWARE INC	10 4	9.375	0.9	10.3
N	GENERAL MTRS (CLS E)	55 39	54.125	1.4	2.6
Q	HOGAN SYS INC	7 4	5.75	0.1	2.2
Q	INFORMIX CORP	12 7	8.5	0.0	0.0
Q	INTELLICORP INC	5 2	4.125	-0.1	-2.9
Q	KEANE INC	19 7	16	0.0	0.0
Q	LEGENT CORP	30 16	29.5	0.4	1.3
Q	LOTUS DEV CORP	28 15	27.75	1.8	6.7
Q	MANAGEMENT SCI AMER	12 6	11.25	0.1	1.1
Q	MICROSOFT CORP	65 45	58.75	4.5	8.3
Q	NATIONAL DATA CORP	34 19	34	2.0	6.3
N	ON LINE SOFTWARE INTL INC	7 4	6.375	0.6	10.9
Q	ORACLE SYS CORP	18 7	17.875	2.5	16.3
N	PANOSPHIC SYS INC	18 12	13.75	1.4	11.1
Q	PHOENIX TECHNOLOGIES INC	19 4	4.875	-0.1	-2.5
Q	POLICY MGMT SYS CORP	35 21	33.375	0.4	1.1
Q	PROGRAMMING & SYS INC	20 12	18	-0.6	-3.4
Q	RABBIT SOFTWARE INC	3 1	0.938	-0.1	-6.2
Q	RELATIONAL TECH INC	18 8	9	-0.3	-2.7
N	REYNOLDS & REYNOLDS CO	34 18	26	0.3	1.0
Q	SEI CORP	20 16	18.5	-0.1	-0.7
Q	SHARED MED SYS CORP	20 14	15.875	0.6	4.1
Q	SAGE SOFTWARE INC	10 6	7.125	-0.6	-8.1
Q	SOFTWARE PUBG CORP	29 16	24.25	3.5	16.9
A	STERLING SOFTWARE INC	8 5	7.625	0.4	5.2
Q	SUNGARD DATA SYS INC	20 13	17.5	-0.3	-1.4
Q	SYSTEMATICS INC	37 26	35.5	1.0	2.9
N	SYSTEM CENTER INC	26 13	24.125	1.1	4.9
N	SYS SOFT INC	27 11	24.5	0.1	0.5
Q	WORDSTAR	4 2	1.813	-0.3	-14.7

## Semiconductors

N	ADV MICRO DEVICES INC	13 7	8.625	0.1	1.5
N	ANALOG DEVICES INC	13 10	10.625	0.5	4.9
N	ANALOGIC CORP	11 7	9.875	0.0	0.0
Q	CHIPS & TECHNOLOGIES INC	26 11	24.75	2.5	11.2
Q	INTEL CORP	34 19	31.5	1.8	5.9
Q	LSI LOGIC CORP	14 8	8.875	-0.4	-4.1
Q	MICRON TECHNOLOGY INC	26 13	14.5	-0.4	-2.5
N	MOTOROLA INC	61 36	59.75	4.1	7.4
N	NATL SEMICONDUCTOR	11 7	6.875	0.0	0.0
N	TEXAS INSTRS INC	47 35	40.625	1.0	2.5
A	WESTERN DIGITAL CORP	15 8	9.25	0.4	4.2

## Peripherals

Q	ALLOY COMP	4 1	2.125	0.3	13.3
N	AMINTL INC	6 5	5.125	-0.1	-2.4
Q	AST RESH INC	16 7	8.625	0.4	4.5
Q	AUTO TROL TECH CORP	6 4	4.5	-0.1	-2.7
Q	BANCTEC INC	16 8	15.25	-0.1	-0.8
Q	CIPHER DATA PRODS INC	11 7	7.75	0.0	0.0
A	COGNITRONICS CORP	7 2	6	-0.5	-7.7
Q	CONNOR PERIPHERALS	15 7	12.75	1.6	14.6
A	DATAPRODUCTS CORP	18 10	13.625	0.6	4.8
N	DATARAM CORP	12 7	11.125	0.0	0.0
N	EASTMAN KODAK CO	52 42	50.625	3.0	6.3
N	E M C CORP MASS	6 3	5.25	0.0	0.0
Q	EMULEX CORP	12 7	8.125	-0.1	-1.5
Q	EVANS & SUTHERLAND	24 13	23	2.5	12.2
Q	ICOT CORP	4 1	1.625	0.1	8.3
Q	INTERLEAF INC	11 6	8	0.3	3.2
Q	IOMEGA CORP	5 2	2.813	0.1	2.3
Q	LEE DATA CORP	4 2	2.5	0.1	5.3
Q	MASTOR SYS CORP	4 2	3.125	-0.4	-12.3
Q	MAXTOR CORP	11 6	9.25	0.6	7.2
Q	MICROPOLIS CORP	13 3	4.25	0.4	9.7
Q	MINISCRIBE CORP	11 1	2.563	-0.3	-10.9
Q	MINNESOTA MNG & MFG CO	79 35	78.375	2.9	3.8
N	PERSONAL COMP PRODUCTS INC	6 4	4.5	-0.1	-1.4
Q	PRIAM CORP	2 0	0.438	0.0	-6.6
Q	PRINTRONIX INC	11 7	8.625	0.4	4.5
N	QMS INC	11 6	10	0.4	3.9
Q	QUANTUM CORP	29 7	26.75	2.5	10.3
N	RECOGNITION EQUIP INC	13 6	8.75	-0.3	-2.8
Q	REXON INC	8 6	7.25	-0.4	-4.9
Q	SEAGATE TECHNOLOGY	16 7	12.5	1.3	11.1
Q	STORAGE TECH CORP	25 11	12.5	0.1	1.0
Q	TANDON CORP	2 0	0.563	-0.1	-9.9
Q	TEKTRONIX INC	24 19	22.625	0.5	2.3
Q	TELEVIDEO SYS INC	1 0	0.281	0.0	-10.2
N	XEROX CORP	69 52	67.875	0.5	0.7

## Leasing Companies

Q	AMPLICON INC	115 11	13.375	-0.4	-2.7
N	CAPITAL ASSOC INTNL INC	9 5	7.125	0.1	1.8
N	COMDISCO INC	30 19	30	1.4	4.8
Q	CONTINENTAL INFO SYS	5 0	0.5	-0.1	-20.0
Q	LDI CORPORATION	17 13	15.25	-0.5	-3.2
Q	PHOENIX AMERN INC	5 3	4.25	0.1	3.0
Q	SELECTERM INC	9 5	8	0.0	0.0

EXCH:N=NEW YORK;A=AMERICAN;Q=NATIONAL

## Driven down

### 3Com takes a hard hit as sales suffer slight summer slump



# Road construction still ahead

*Network connections remain to be made for science, educational groups*

BY PATRICIA KEEFE  
CW STAFF

"Are we there yet?"

So near, and yet so far. That aptly sums up the predicament in which U.S. scientists and university researchers find themselves yearning for the day when the current mishmash of campus, regional and nationwide research and educational computer networks are neatly tied together into one streamlined, coordinated and compatible mass transit system.

Parts of the network are already in place but lack the signposts that show how to get there from here or the exit ramps needed to pull off the road.

These services are necessary, however, to "push the network down and out into the hands of the people who see

computers and networks as tools and not an end in and of itself," said Kent England, director of networking and systems engineering at Boston University and one of the co-founders of the New England Academic Research Network (Nearnnet).

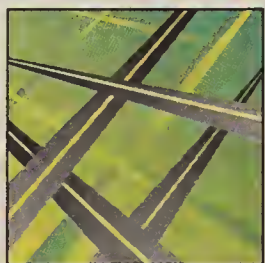
The impetus for this glimmering, three-tiered superhighway is a flurry of overlapping network overhaul projects and legislative activity bolstered by a need for research communities to be competitive as well as cooperative (see story page 1).

This traffic jam of activity provides an opportunity to develop some consensus on the kinds of technology being used, while also providing a forum to

address the very problems inherent in such an enterprise. "There are several thrusts related to national networking — they are all similar in architecture, protocols and design, and they are all moving toward a common goal," England said.

Along the way, several potholes dot the road to success: standards, bandwidth, support and security. A truly successful, transparent network is impossible without resolving these issues.

The entire layer of networks is pretty much standardized on Unix-based Ethernets running Transmission Control Protocol/Internet Protocol. They initially break down into 10M bit/sec. backbones at the local level,



## Science

FROM PAGE 1

ple, one system would keep feeding "graphical output from a running problem" to a second system for calculations and human interaction, he said.

As a result, Pittsburgh and other research institutions "are in [the] habit of mailing large numbers of magnetic tapes around and waiting for things to show up" in days or weeks, when they want such exchanges to take minutes or even seconds, Levine said.

The lack of high-speed links has caused researchers to limit, or even table, certain projects that require major collaboration across distance, Levine said. Pittsburgh plans to extend several atmospheric modeling projects, "both geographically and in terms of collaborative span," as soon as high-speed links become available, Levine said.

However, most researchers have gotten into the habit of automatically "filtering out" highly collaborative projects because the networking capability is not there, he added. This may have resulted in a "chicken and egg" problem in which potential developers of such a network have been unable to find enough potential user interest to cost-justify

the project, according to Levine.

Therein lies the importance of the \$400 million in federal funding that NREN will receive over the next five years if Gore's proposed National High Performance Computer Technology Act of 1989 is approved.

The bill, which has a good chance of being passed by year's end, Gore said, would authorize \$1.75 billion over the next five years toward the development of supercomputing, artificial intelligence and other technologies designed to further U.S. research efforts.

"We have to think of infrastructure in a new way. We can no longer confine definition to bridges, highways, waterlines; [we] have to think of information superhighways, digital libraries, strategic software and other resources that can be shared by all in the country," Gore said.

The analogy of a superhigh-

way is an apt one, "since it is something everyone would use and that the government really has to step in and pay for," a congressional staffer said. What may be the most difficult aspect of the project, he added, is not the highway itself but the "infrastructure: hotels, rest areas, street signs, gas stations."

In computing terms, this refers to the management aspects of the network: directories and databases to keep track of resources available on the network; naming services to allow users to access a resource without knowing its exact location; security systems to guard against unauthorized access; and gateways to hook up regional networks that use different communications protocols.

Another area of research that several government and military groups are already exploring is networking protocols specifically designed for multigigabit/sec.

rates. "Some people say that both [Open Systems Interconnect and Transmission Control Protocol/Internet Protocol] will run out of steam around 200M bit/sec. across country," Wolff said, "so it's likely that the multigigabit/sec. network will use neither."

Some kind of communications standard is necessary, said Kenneth King, president of Educom, a Washington, D.C.-based con-

jumping to 45M bit/sec. at the regional level and then up to 1G to 3G bit/sec. at the national level, according to Melanie Zibit Goldman, a technical consultant at Harvard University's Office for Information Technology.

After the Internet virus, which went out over the national backbone, it is no surprise that security is a hot issue. Yet it is a difficult problem to resolve because it needs to be integrated into the computer operating system and network software.

Nevertheless, progress has been made. MIT's Athena project — a joint research effort with the school, IBM and Digital Equipment Corp. — has produced the Cerberus protocol. Named after the three-headed dog that guarded the gates of Hades in Greek mythology, Cerberus is already an Internet draft standard and is in use at MIT and other sites. Its features include encryption, authentication and validation. "It is already making its presence felt, but it will be a few years before it is widely im-

plemented," England said.

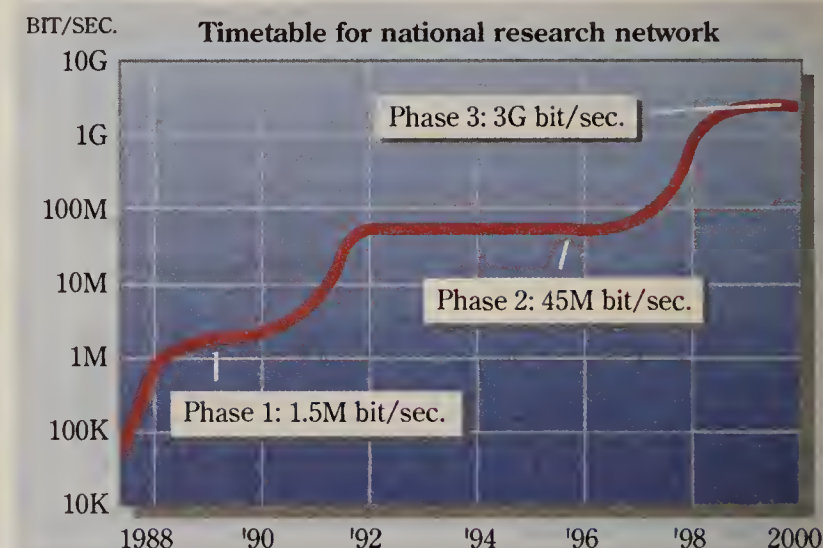
Other areas of concern and ongoing research revolve around developing an electronic, networkwide version of the familiar White and Yellow Pages, which would allow a user to locate a service or another person on the network. Pilot work is under way at the regional network level in CCITT X.400 and X.500 services. Nysernet, the New York state network, is experimenting with directory services.

Bridging between individual locations is done through a variety of means. The first to use microwave Ethernet transmission, Nearnnet has deemed it a success, despite an apparent eight-mile limitation. X.25 and T1 networks are the norm, however.

The current 1.5M bit/sec. speed of the NFSnet is expected to give way to 45M bit/sec. and eventually to a global multigigabit/sec. speedway. Today, bottlenecks are commonplace. "Traffic across the national network is doubling every month," Zibit Goldman said.

## Faster than a speeding bullet

*Supernet project envisions three-phase buildup to 3G bit/sec. target*



SOURCE: EDUCOM

CW CHART: DOREEN DAHLE

sortium of 600 colleges and universities that work cooperatively on computing and communications technologies.

"We need standards for querying databases, and for people to add local databases to the network and a consistent interface for swimming through the network [to access resources]," King said. "Otherwise we'll have the same tower of Babel we have now."

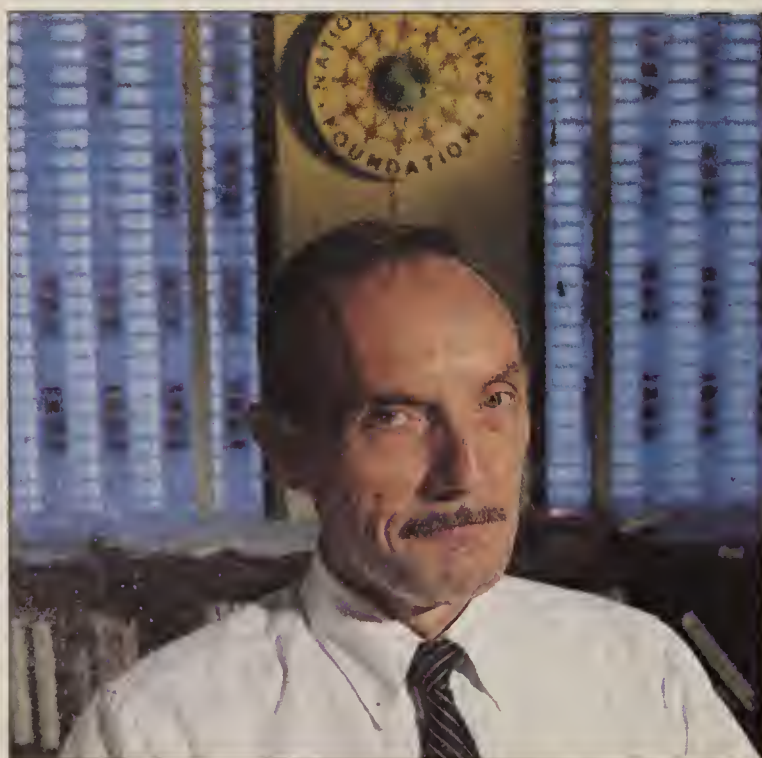
Academic, commercial and government research groups communicate with one another, and with remote supercomputing centers, via a series of haphazardly overlapping and interconnected regional networks, each of which has its own user interfaces, high-level communications protocols and access methods. NREN would potentially iron out the protocol differences and interconnect these networks over a single, high-speed backbone (see story above).

In addition to fostering collaboration in the research community, NREN will make com-

puting resources more readily accessible to users — particularly researchers in small institutions that cannot afford their own supercomputer, for example. The ultimate goal of the network is "to provide access to all scientific instruments, databases and knowledge resources worth sharing in the world," King said.

Gore's bill, even if it goes through, will only provide the seed money to address these technological issues, King said. The other side of the equation is the commercial vendor community, which has already shown a strong interest in the NREN project.

Northern Telecom, Inc., AT&T's Bell Laboratories and Cray Research, Inc. have all sent speakers to testify at Senate hearings on the Gore bill. As the project begins to gain momentum, vendors will be drawn further into it because the network participants will provide both a test bed for new products and a potentially rich market for such services.



KATHERINE LAMBERT

**NSF's Wolff** envisions high-speed scientific collaboration



# Internet propels U.S. research

*Evolving national network engenders fruits of scientific collaboration*

BY AMY CORTESE  
CW STAFF

Internet, the web of networks connecting U.S. government, research and academic institutions, gained the nation's attention last year when a virus paralyzed roughly 3,000 computers at more than a dozen sites tied to the network. As the government ponderously moves to try suspect Robert T. Morris Jr., who allegedly unleashed the virus from an Internet connection while a graduate student at Cornell University, thousands of researchers in the U.S. have long since gotten back to the tasks at hand, attempting to break new ground on the network.

The electronic mail and information exchange made possible by Internet have had a tremendous impact on the research community. For instance, the development of the X Window System, started at MIT in 1984 and continuing today, is carried out over the network largely by electronic communications between MIT and such companies as IBM, Digital Equipment Corp. and Hewlett-Packard Co. "Practically speaking, it would not have happened without Internet," said Bob Scheifler, director of the X Consortium at MIT.

The ability to remotely log in to powerful supercomputers and specialized equipment has brought scarce resources and new possibilities to the doors of many small universities and research organizations that otherwise could not afford such equipment of their own.

Network proponents say that is just the beginning. They envision the emergence of the "collaboratory," essentially a "workplace without walls," as well as a bounty of applications — for instance, an electronic

marketplace through which suppliers and buyers can transact business — just waiting for the right infrastructure.

The Internet system is a federation of networks using Transmission Control Protocol/Internet Protocol. Much as our system of national highways helped to link far-flung people and places, Internet forms an electronic infrastructure supporting widespread communications and collaboration.

The Internet technology grew out of Arpanet, the granddaddy of networks, sponsored by the Defense Advanced Research Projects Agency (DARPA) in the 1970s. Today, the aging Arpanet is just one component of Internet, and Internet itself will evolve over the next decade

into a higher capacity and higher speed network called the National Research and Education Network.

Since the advent of Arpanet, network usage has mushroomed.

Steve Wolff, director of the networking division at the National Science Foundation (NSF), said that estimated traffic on NSFnet — the network that makes up the largest component of Internet — grows at 20% to 30% each month; one billion packets of data were transmitted in June.

Researchers are using Internet to push ahead with projects spanning the range of sciences.

At Colorado State University (CSU) in Fort Collins, researchers are using Internet to understand the consequences of the changing climate and global warming trends on the environ-

ment. Increasing levels of carbon dioxide are being trapped and then heated by the sun, causing the average temperature of the Earth to increase and resulting in what is known as the greenhouse effect. Studies exploring this trend are being carried out at various universities.

Bill Lauenroth, a professor of range sciences at CSU, is concentrating on the effects of climate change on the grasslands in collaboration with researchers from the University of Virginia in Charlottesville who are studying the effects on forestland.

## Calculations

The research teams have each developed a mathematical model simulating grasslands and forests. The interdependent programs run simultaneously on Unix systems at both universities; the results of one model serve as input for the other. A master control program, developed by CSU, allows the programs to exchange information over the network automatically so that the programs can be run at night and the results will be waiting for researchers in the morning, according to Lauenroth.

The first phase of the research will be completed a year from now. The results will help project potential effects of changes in temperature and rainfall on vegetation. Lauenroth said this information will be added to an accumulating body of knowledge on the effects of global warming.

Internet has been a key factor in the researchers' progress. "In the past, the way we would have solved a problem would be to get the groups involved in one place," Lauenroth explained. With Internet and the telephone, he said, researchers do not have to get together as much.



ISI's Cohen



Harvard's Crane

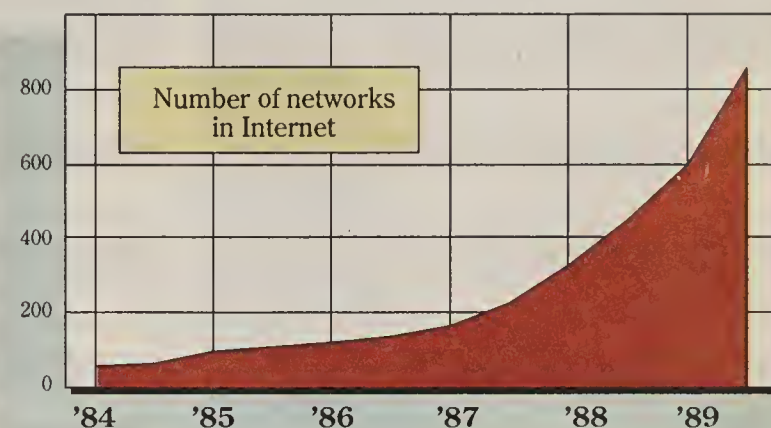
At the University of Southern California's Information Sciences Institute (ISI), Internet has been used since the early 1980s to speed up the order and delivery of very large-scale integration (VLSI) chips. ISI processes chip designs for a few hundred chip designers, accepting the designs over the network and then processing and preparing them for manufacturing.

Although most of the chip de-

assist in building a multimedia database for the study of ancient Greece [CW, Jan. 9]. The Perseus project, as it is called, is attempting to reconstruct the classical Greek world through the collection and storage of text, translations, color images, maps and drawings that are contributed by museums and archeologists. The database will be used as a reference source for students and others interested in

## Rapid acceleration

The number of networks making up Internet has soared since 1987, connecting an estimated total of 1 million to 3 million users



SOURCE: BBN SYSTEMS & TECHNOLOGY CORP.

CW CHART: FRANK C. O'CONNELL

signs originate at universities and research organizations, some commercial companies are taking advantage of the service, particularly for prototyping and small quantities, according to Danny Cohen, director of ISI's Systems Division.

Once the design is completed on a graphics workstation, its description is stored in an ASCII standard format agreed upon by the VLSI design community and sent as an electronic message over the network to ISI's metal oxide semiconductor implementation service. ISI processes and prints out the designs and sends them out to be manufactured. The chips are then mailed to the designing organization.

National networks are also boosting research in the arts and humanities. Internet is being used at Harvard University to

Greek classics.

Greg Crane, a professor of Greek classics at Harvard, is using Internet to coordinate work on the project. Much of the compilation is conducted in Chicago, but with Internet, "I've been able to supervise four people doing work on a Sun workstation in Chicago," Crane said.

Stephen C. Hall, director of Harvard's Office for Information Technology, said, "We're trying to get people to think about what are the uses of a network."

As networking technology continues to advance, Hall and others envision a new infrastructure developing that connects local networks to regional networks and links them all to the national backbone network. Hall predicted, "These networks are just the first wave of this new infrastructure."

## NAS drops charges claiming IBM favoritism in Georgia

BY J. A. SAVAGE  
CW STAFF

ATLANTA — National Advanced Systems last week called off its lawsuit against the state of Georgia's Department of Administrative Services over what the company said was unfair competition between it and IBM in the department's purchase of two mainframes.

Amdahl Corp., which has also sued the state, is still pursuing its complaint.

NAS dropped its suit because of the high cost of litigation, according to the company. Both NAS and Amdahl filed suit in

June over the bid benchmark, which they said favored IBM [CW, July 10].

The two companies were unsuccessful in obtaining an injunction against the state to halt the installation of the pair of IBM 3090 Model 600E mainframes in June. One has been installed.

NAS' move "caught everybody off guard," said Steve Dix, regional counsel for Amdahl in Atlanta. Amdahl concluded that it would pursue the case alone. A hearing is expected this November. "The law in Georgia says that if we're successful, [the IBM machines] will have to come out," Dix said.

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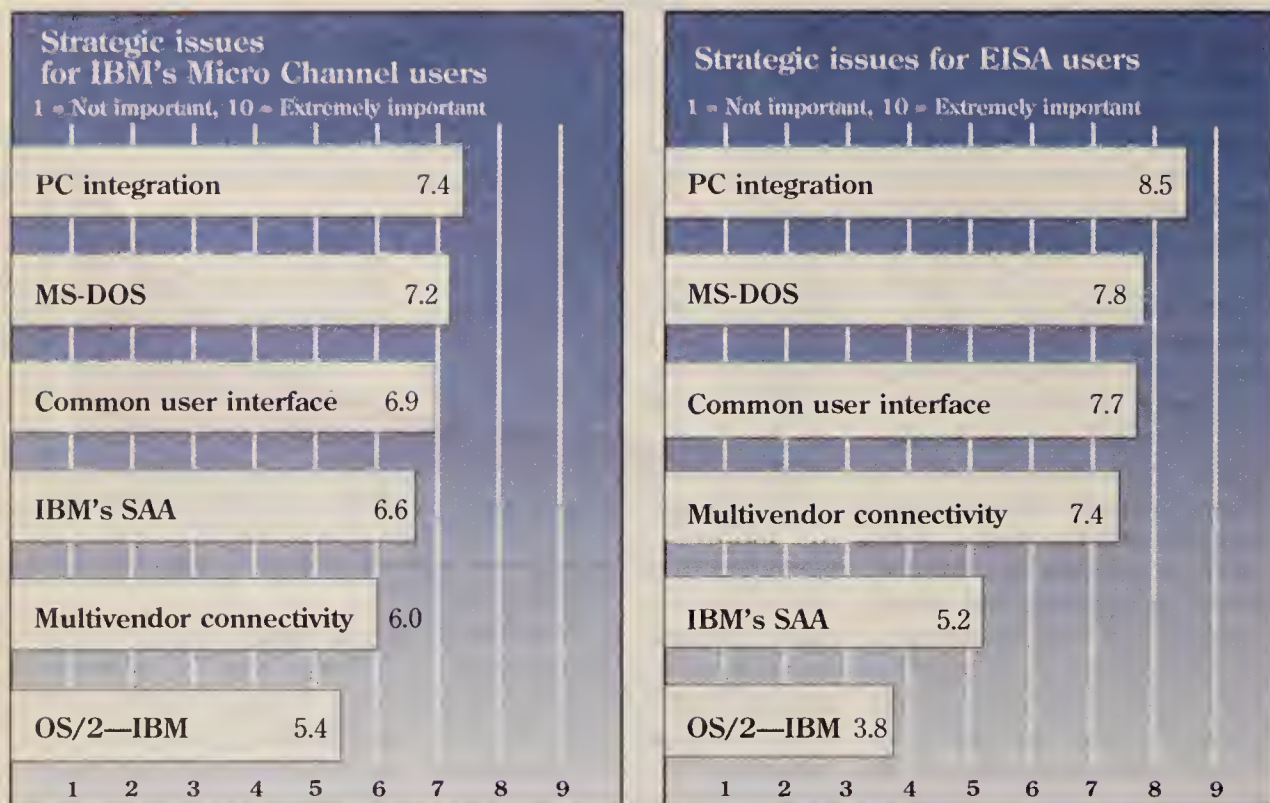
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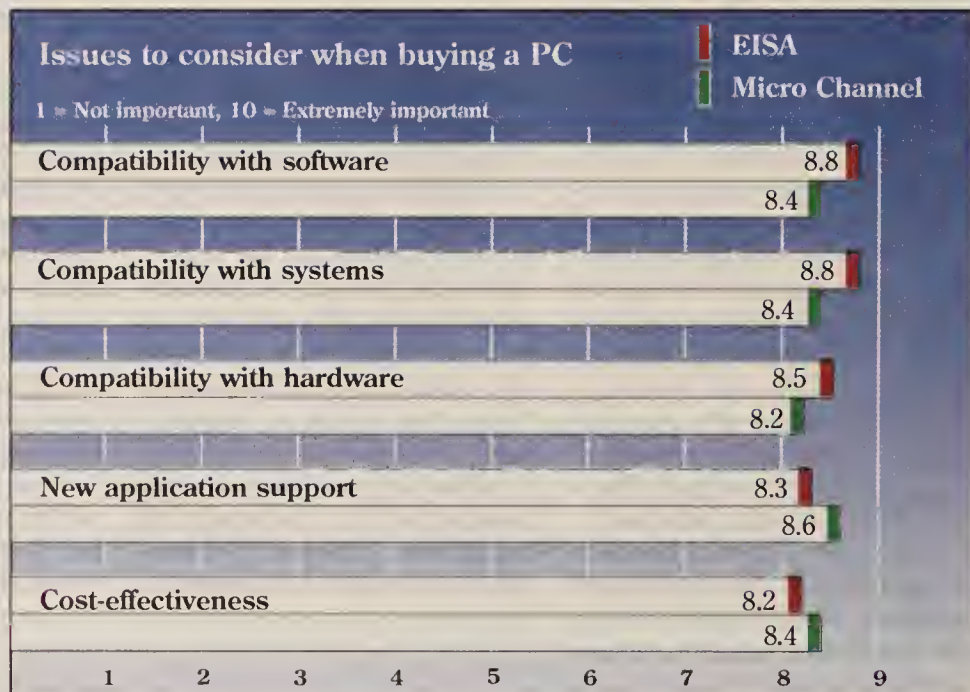
## IBM's Micro Channel vs. EISA

In a survey of 459 manufacturing firms, users who have chosen one standard or the other ranked strategic issues to their companies



The interests of Micro Channel users lie in IBM standards while the users of EISA look at connectivity. One issue that both groups do agree on is the importance of PCs working with existing information systems.

When buying a PC, Micro Channel users will be most concerned with new application support while EISA users will be looking at compatibility issues



SOURCE: THE SIERRA GROUP, INC., TEMPE, ARIZ.  
CW CHART: JOHN YORK

## N E X T W E E K

Allan Ditchfield, senior vice-president of MIS at MCI Communications Corp., has advantages that IS directors dream about, such as a sophisticated network. Still, the job of coping with the growing firm's hard-charging corporate culture is no snap. A profile appears in Manager's Journal.



KATHERINE LAMBERT

Why is white-collar productivity declining when investment in end-user computing is rising? The answer may be that few organizations have reached the transformative stage of end-user computing. To see where your firm fits on the achievement potential curve, read In Depth.

## INSIDE LINES

### Wyse guise

The fate of financially ailing Wyse Technology continues to provide ample fuel for speculation. Reports have surfaced that the San Jose, Calif.-based terminal and PC maker is considering an outright sale or even a leveraged buyout if it can get financing, which it is said to be seeking. Trouble is, the company has been losing money steadily. A merger may also be in the offing, and two Taiwanese PC companies — Mitac and Acer Group — continue to crop up when that option is mentioned. Stay tuned.

### Lord of the Rings

Remember all those 16M bit/sec. Token-Ring products announced last fall for introduction this spring? Seen any? Texas Instruments, which has been trying to develop a 4M/16M bit/sec. chip since last year, can't figure out how to solve the switching issue between the two speeds, said Dirk Gates, president of Xircom, a producer of laptop connectivity products.

On the latest schedule, no alternative 16M bit/sec. Token-Ring adapters are likely to appear until the end of the first quarter.

### This one got BIOS

The first rash of Lotus' 1-2-3 Release 3.0 bug stories concerned incompatible BIOS problems. Now comes word that at least two brands of megabyte-memory PCs that use RAM shadowing — Zenith Data Systems and AST Research — are having problems. The problem is related to the fact that the new release is pretty memory-intensive, taking up an estimated 700K to 800K bytes of RAM, and does not take into consideration systems using shadow RAM. Going into the CONFIG.SYS file in MS-DOS and removing the virtual 8086 driver is said to be one way around the memory conflict. AST has reportedly developed a fix.

### A different freeze

While telling Wall Street of a hiring freeze last week, Unisys was also describing an as-yet-unannounced mainframe performance monitor at a user group presentation in San Francisco. Called CMF.Snapshot, the PC-driven software package collects its information by being wired to an A series or Series 1100/2200 mainframe. The colorful output, spiced with graphics, graphically portrays what is going right — or wrong — with the system.

The package, to be announced in September, will be available for V series machines in 1990.

### Did we say September?

The rumor mills are abuzz with Netware news. Here's a sampling: Don't look for volume availability of Netware 386 in September. Novell is trying real hard to get its 32-bit network software ready for a Sept. 11th unveiling, but at least one consultant/user was told by his Novell liaison that he will not see Netware 386 next month.

Moreover, Netware 386 is having problems handling large disks and memory management, according to one source, and reportedly is not for small LANs, unless you are willing to go to an EISA or MCA 32-bit bus. Looking to sometime in 1990, Netware 386 Version 3.1 reportedly will offer a Desqview 386 compatibility shell. By the end of next year, either 3.1 or 3.2 will have implemented a global naming scheme similar to Banyan Systems' Streettalk and the CCITT X.500 directory services standard.

Fred Wang may look to start a new career at Rodney Dangerfield's stand-up comedy club. A New England newspaper printed a cartoon the day of his resignation picturing a mangled garage and a voice calling out, "Dad, I crashed the car." On Wall Street, they're into another type of vehicle, where the joke is that there's no truth to the rumor that Fred's mug will be employed on McDonald's soft-drink cups promoting the movie, "Daddy, I Shrunk the Company." If your humor is just as twisted, share it on our bulletin board (508-626-0214). You can also upload more substantive matters or call them in to News Editor Pete Bartolik at 800-343-6474.





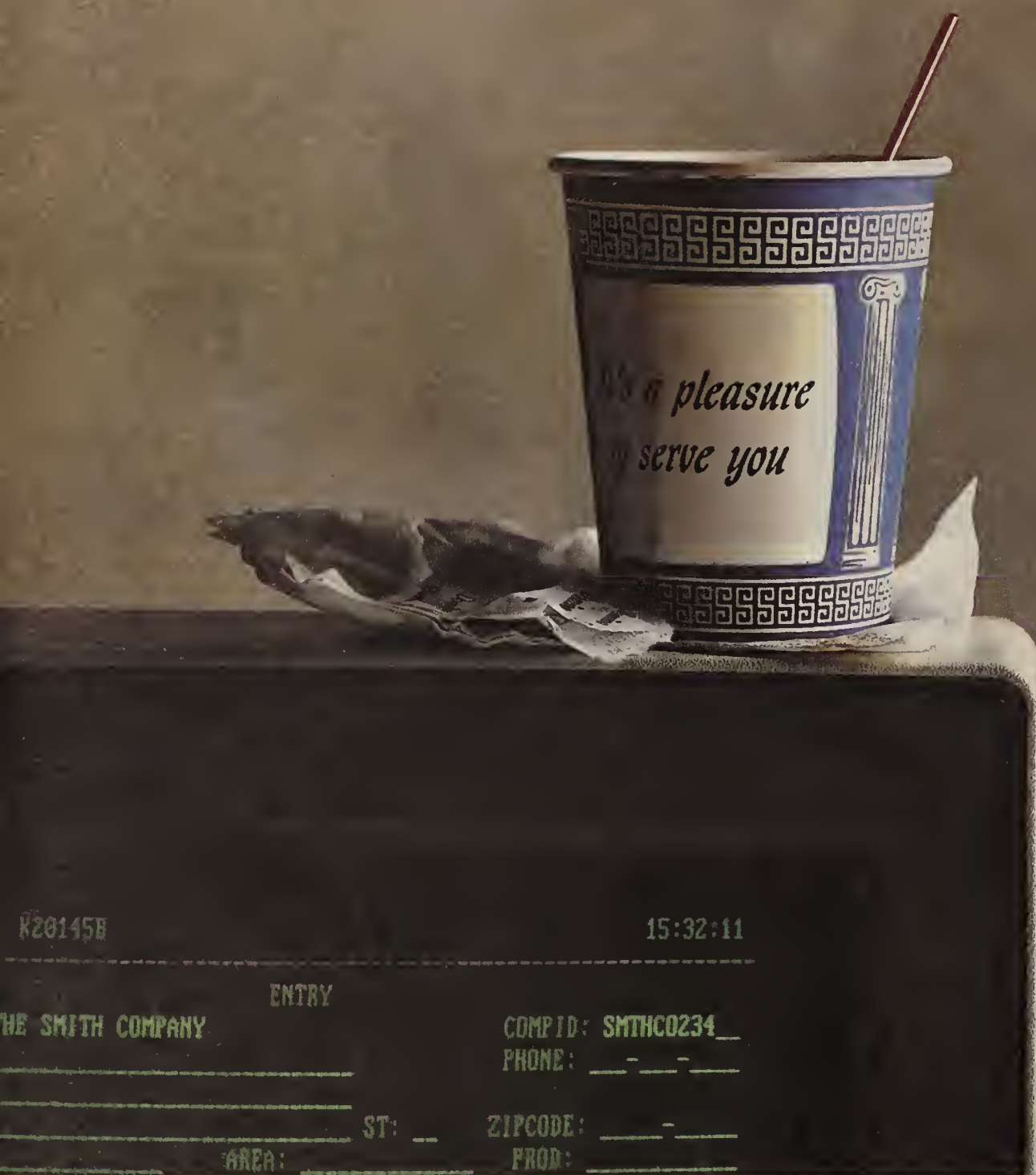
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